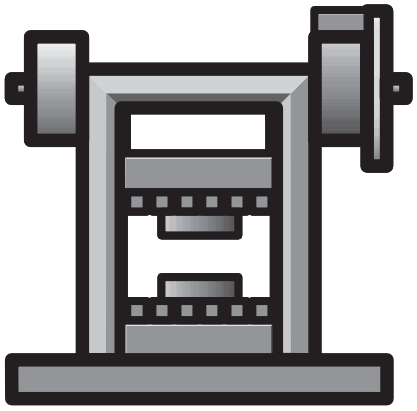
Allen-Bradley

# User Manual

## Clutch/Brake Control with MicroLogix Processors

*(Cat. No. 6556-MLCBK and 6556-MLCBKDC)*



## Important User Information

Because of the variety of uses for the products described in this publication, those responsible for the application and use of this control equipment must satisfy themselves that all necessary steps have been taken to assure that each application and use meets all performance and safety requirements, including any applicable laws, regulations, codes and standards.

The illustrations, charts, sample programs and layout examples shown in this guide are intended solely for purposes of example. Since there are many variables and requirements associated with any particular installation, Allen-Bradley does not assume responsibility or liability (to include intellectual property liability) for actual use based upon the examples shown in this publication.

Allen-Bradley publication SGI-1.1, *Safety Guidelines for the Application, Installation, and Maintenance of Solid-State Control* (available from your local Allen-Bradley office), describes some important differences between solid-state equipment and electromechanical devices that should be taken into consideration when applying products such as those described in this publication.

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Throughout this manual we use notes to make you aware of safety considerations:

**ATTENTION:** Identifies information about practices or circumstances that can lead to personal injury or death, property damage or economic loss.

Attention statements help you to:

- identify a hazard
- avoid the hazard
- recognize the consequences

**Important:** Identifies information that is critical for successful application and understanding of the product.

PanelBuilder, PanelView and MicroLogix are trademarks of Rockwell Automation.

# Using This Manual

## Manual Objectives

This manual describes how to apply the 6556-MLCBK or 6556-MLCBKDC Clutch/Brake (C/B) Control Kit to your mechanical stamping press. The manual helps you install, test, and operate the clutch/brake control.

## Qualifications for Applying this Product

Only qualified installers should apply this control to a mechanical stamping press. We assume that the installation team includes:

- a professional stamping press builder or re-builder knowledgeable in press and press control standards
- an electrical technician skilled in installing electronic control equipment

## Terms and Abbreviations

You should become familiar with these abbreviated terms. For complete definitions of clutch/brake terms, refer to ANSI B11.1-1988 section 3.

| Term | Definition |
|---|---|
| anti-repeat (ACAM) RCLS | a device designed to limit press operation to a single cycle if the actuating means is held actuated. |
| bottom position | the part of the press cycle where the dies are closed |
| brake monitor (BCAM) RCLS | a device designed to prevent the next stroke if stopping time or distance exceeds a preset |
| buttons | palm-type pushbutton switches used by an operator for starting and stopping the press |
| clutch/brake valve | the main valve that controls the flow of air to the clutch/brake mechanism |
| continuous mode | the mode where the control maintains continuous stroking after an operator starts the press |
| downstroke zone | the part of the press cycle when the press travels from near-top zone (through bottom) to the upstroke zone |
| fault detection for valves | *internal:* valve is designed to turn itself off when it faults. |
| grounded ac power | ac power distribution where the “L2” side of the ac line is grounded |
| inch mode | a mode that lets an operator move the press incrementally by pressing and releasing run-station buttons |
| micro–inch mode | a mode that lets an operator move the press incrementally by pressing and releasing run-station buttons using a slower motor |
| near top zone | the part of the press cycle when the press is at the top of its stroke |
| RCLS - rotary cam limit switch | a switch that rides a rotating cam to provide information on the position of the press drive shaft |
| run station | a press operator’s point of operation that typically contains a pair off pushbuttons to start or stop the press |
| single-stroke mode | a mode that allows the operator to run one complete press stroke, usually started at the top |
| solenoid valve | an on/off electrically-driven valve |
| takeover (TCAM) RCLS | a device designed to allow upstroke without the operator holding the run/inch buttons |
| top stop | a command designed to stop the press at the top of its stroke |
| upstroke zone | the part of the press cycle when the press travels from the end of downstroke to the near-top position |

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# Overview

## Chapter Objective

The purpose of this chapter is to acquaint you with your Allen-Bradley Clutch/Brake Control (cat. no. 6556-MLCBK). Topics include:

- Contents of the kit
- Control by redundant processors
- Protected memory in MicroLogix-1500 processors
- Modes of operation
- Functional block diagram
- Clutch/Brake control functions
- Panel Switches
- Rotary cam limit switches for position monitoring
- Input switches
- Outputs
- Response time
- Related safety documentation
- Control system specifications

**ATTENTION:** The clutch/brake control system is designed for use only with mechanical stamping presses having a *part-revolution* friction clutch and/or brake. Applying this control to any other type of press could result in personal injury and/or damage to equipment.

## Contents of the Kit

Clutch/brake control kit (cat. no. 6556-MLCB or -MLCBDC) includes:

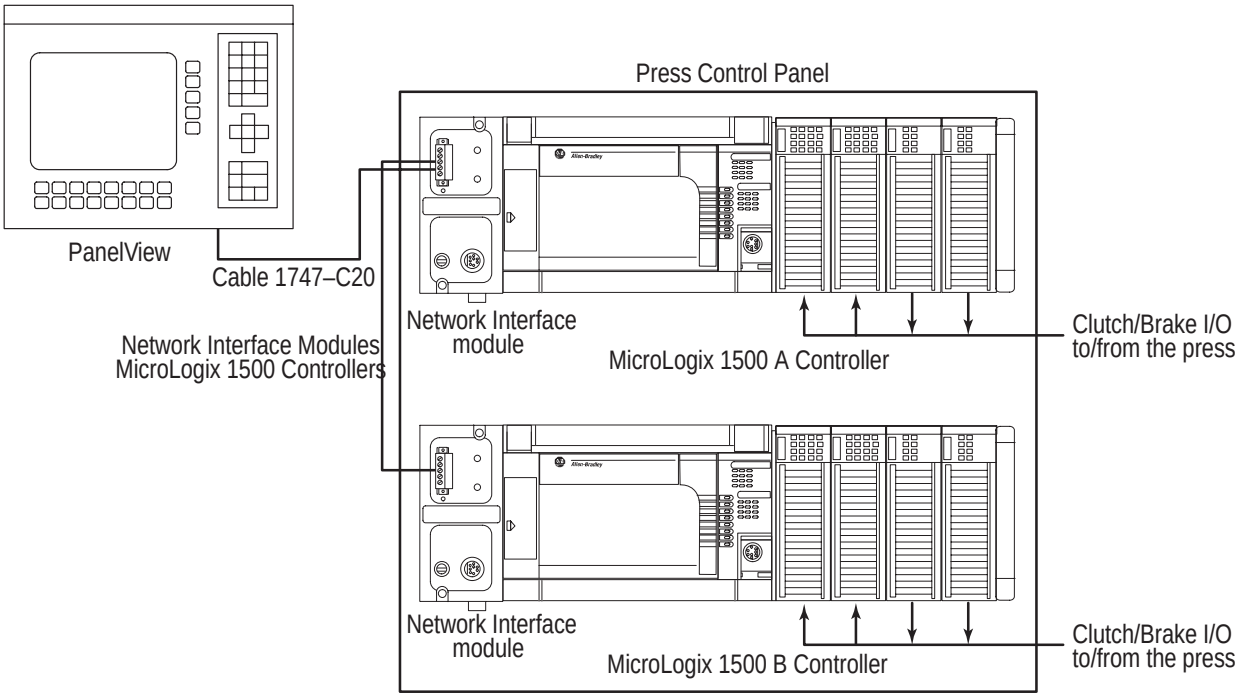
| Hardware Included | for -MLCBK | for -MLCBKDC | Hardware *That You Provide* |
|---|---|---|---|
| Micrologix 1500 Processor | 1764–LSP (2) | 1764–LSP (2) | |
| DC Base W/ DC 16IN/12OUT | 1764–28BXB (2) | 1764–28BXB (2) | • Input Switches and Run Stations (Application Dependent) |
| Memory Module w/ Real Time Clock | 1764–MMIRTC (2) | 1764–MMIRTC (2) | • Rotary Cam Limit Switches (2 sets) |
| 16 pt Input Module | 1769–IA16 (ac) (2) | 1769–IQ16 (dc) (6) | |
| 8 pt Input Module | 1769–IA8I (ac) (4) | | • Solenoid Valves (4) with Internal Fault Detection |
| 8 pt AC/DC Isolated Relay Module | 1769–OW8I (ac/dc) (4) | 1769–OW8I (ac/dc) (4) | |
| Compact I/O Terminator Cap RT | 1769–ECR (2) | 1769–ECR (2) | • Operator Interface (1) – PanelView 550 (6556-PV550) or (6656–PV600) |

**Important:** The purchase of this kit includes the license to use this control on *one* stamping press.

## Control by Redundant Controllers

This clutch/brake control uses two independent MicroLogix–1500 controllers A and B.

Both controllers monitor all clutch/brake I/O and exchange information about machine status. They are linked by hardwired I/O so that if one controller detects a condition different from that detected by the other, its control logic is designed to declare a fault and turn off all outputs to press valves. The other controller is designed to follow suit.




## Protect Memory in MicroLogix 1500 Processors

The logic of this control is pre-programmed and burned into processor memory at the factory. It cannot be changed except by return to Allen-Bradley. This Protect Memory is pre–installed into the MicroLogix 1500 Processor.

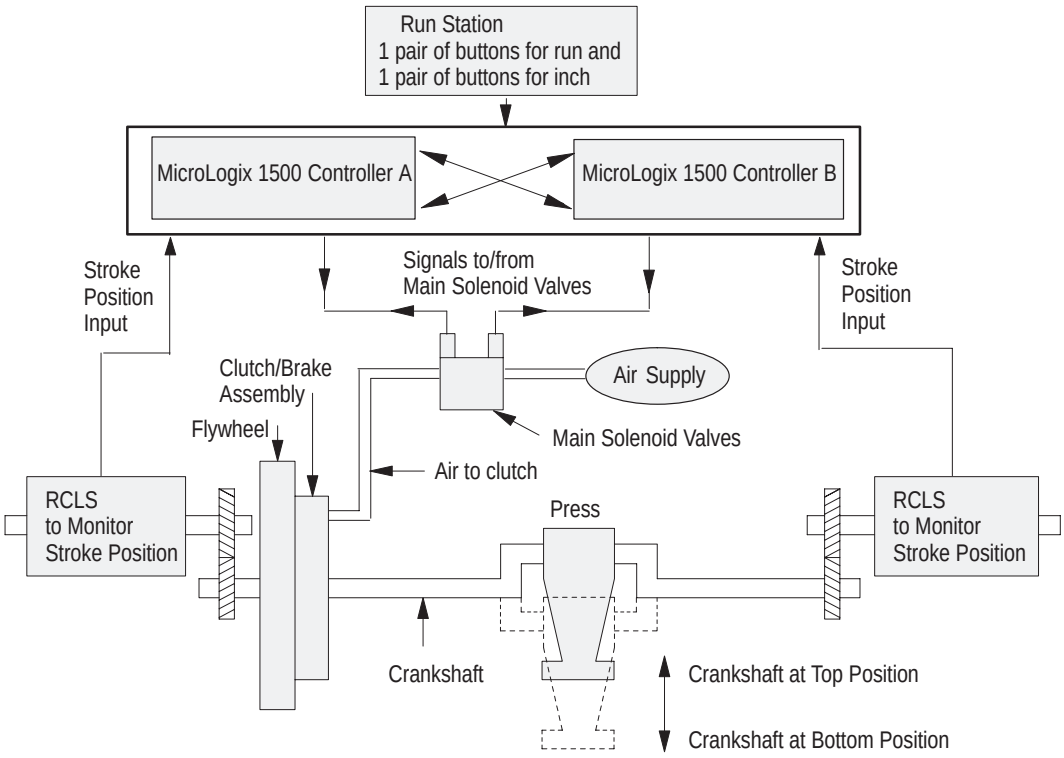
## Modes of Operation

The operator can select the mode of operation with the selector switch located on a control panel. In accordance with ANSI B11.1 Section 4.12.4.1, the selection of operating mode must be capable of supervision (lockable).

| This Mode: | Lets the Operator: |
|---|---|
| Off | Disable operation of the clutch/brake control when the press is not in operation. |
| Inch | Jog the press through successive parts of the cycle by pressing and releasing the pair of inch buttons. If the buttons are held, the press will stop at the top of its stroke. |
| Single-stroke | Run the press through one complete cycle by holding both run buttons until completion of the down stroke. |
| Continuous | Run the press continuously until stopped by a stop-on-top command, or until a fault is detected. To start the press, you press the ARM CONTINUOUS switch and then press the pair of run buttons within five seconds. |
| Micro Inch | Jog the press through successive parts of the cycle by pressing and releasing the pair of inch buttons using a slower motor. If the buttons are held, the press will stop at the top of its stroke. |

## Functional Block Diagram

The functional block diagram in shows the relationships between mechanical components of a stamping press and the C/B control.




## Clutch/Brake Control Functions

Clutch/brake control functions are summarized in the following table.

| Control Function: | Operating Mode: | Description: |
|---|---|---|
| Stop-on-top (cycle stop) | Continuous | Lets the operator stop the press at top of stroke |
| Interrupted stroke | Single-stroke or Continuous | Lets the operator stop the press by releasing a run/inch button during downstroke. |
| Anti-tie-down | All | Prevents the press from starting a new stroke if the control detects that an operator has tied down the run/inch buttons. After run/inch buttons are released, the operator must press both buttons at the same time. |
| Anti-repeat | Single-stroke Inch or Micro Inch | Limits press operation to a single stroke, even if the operator continues to press both run/inch buttons. The operator must release and press them again to start the next stroke. |
| Motion detector | Single-stroke or Continuous | Detects press motion from a hardware or software input. |
| Brake Monitor | All | Prevents restarting the press when the control detects an over-travel condition. |

## Panel Switches

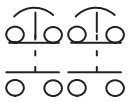
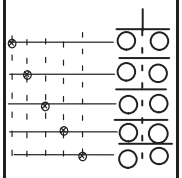
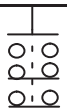
Typically, your control panel would have these switches: 5-position key- lockable mode selector, E-stop, cycle stop, control reset, and C/B power reset. You purchase them separately. For more information, see the table below.

## Rotary Cam Limit Switches

You will need two pairs of rotary cam limit switches. We recommend Allen-Bradley Cat. No. 803-P775 that you purchase separately.

## Input Switches

The clutch/brake control requires input switches listed below: You purchase them separately.

| Device | Symbol | Purpose | Type | Allen-Bradley Type | Qty |
|---|---|---|---|---|---|
| Palm Buttons for Run Station |   | • Lets press operators start the press<br>• Assures 2-hand operation<br>Note: Position run/inch buttons at least 24" apart., and the run station in accordance with ANSI B11.1 appendix A. | Momentary pushbuttons dual contact normally closed (N.C.) and normally open (N.O.) | (2) Articulated Palm Buttons 800P-F2CA or 800Z–HLZY | 1 pair |
| Stop on Top | | • Stops press at top during continuous stroking<br>• No effect in single mode | Momentary pushbutton single N.C. contact | Yellow Mushroom-head 800T-D9B | 1 |
| E-Stop | | • Stops the press immediately<br>Note: Wire switches in series as needed. | Momentary pushbutton single N.C. contact | Jumbo Mushroom-head 800T-FXP16RA5 | 1 or more |
| Mode Select |  | • Lets you select the operating mode:<br>Off<br>Inch<br>Single<br>Continuous<br>• Micro Inch | Rotary, 5-position key lockable | N/A | 1 |
| Arm Continuous | | • Lets you begin a timed interval within which to start continuous mode. | Momentary pushbutton single N.O. contact | Black Momentary Pushbutton 800T-A2A | 1 |
| Main Motor Forward Interlock | | • Monitors whether motor-forward starter is engaged. If not, it opens to prevent running the press in single or continuous mode. | N.O. auxiliary contact for forward motor starter | Motor Starter Auxiliary Contact 595-A | 2 |
| Air Pressure | | • Monitors Clutch/Brake air pressure.<br>Note: Switch must be ON to engage the clutch. | N.O. single throw from pressure switch | Pressure Switch 836-C8JX321 | 1 |
| Motion Detector Interlock | | • Detects if motion is stopped in single or continuous mode. | N.O. single contact | N/A | 2 |
| Control Reset | | • Lets you manually reset power to valve solenoids at power up or after an E-stop. | Momentary pushbutton single N.O. contact | 800T-A2A | 1 |
| Clutch/Brake Power Reset |  | • Lets you manually reset clutch power on power up or after E-stop. | Momentary pushbutton triple contact 1 N.O. and 2 N.C. | 800T-A2B | 1 |

## Outputs

The clutch/brake control has two pairs of outputs from each I/O chassis (chassis A and B) for your clutch/brake valves.

**Important:** The control is designed to operate with valves that have *internal* fault detection. There are no inputs for valve-stem feedback. Examples of dual solenoid safety valves with internal fault detection are the Herion XSz Series or Ross SERPAR Crossflow Double Valve with L–G Monitor.

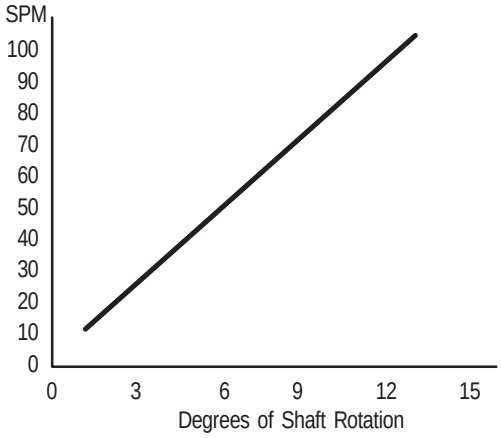
## Response Time

The worst case time required for the clutch/brake control to respond to a change of input depends on the sum of these response times:

| Device: | Delay (ms): |
|---|---|
| Input Module 1769-IQ16 response time | 8 |
| Processor scan of C/B code (2k words) | 3 |
| Output Module 1769-OW8I switching time | 10 |
| Total worst-case response time | 21 |

The number of degrees that the shaft continues to rotate beyond the moment at which the input changes depends on the speed of rotation. The greater the speed (strokes per minute), the further the shaft rotates before a command from the control is applied. We graphed the degrees of shaft rotation vs press speed for a response time of 21 ms.

**Figure 1.1**
**Shaft Rotation for a 21 ms Response Time of the Clutch/Brake Control System**




**Important:** When estimating the braking distance in degrees of rotation, you must add the rotation occurring during system response time to the specified downstroke braking distance. (For example, at 100 SPM, the shaft rotates *12°* during a 21 ms system response time plus the braking distance.)

## Related Safety Information

You are responsible for the safety of the installed press control, and for meeting all applicable laws, codes, and safety requirements. This control deals only with electrical control portions of the clutch/brake mechanism.

**ATTENTION:** The installer of this control must follow ANSI B11.1 regarding mechanical power presses, OSHA 1910.217, and other applicable standards pertaining to safety recommendations related to:

- machine construction
- general electrical
- machine guarding
- point-of-operation guards, light curtains gates, 2-hand switches

In addition to local codes and laws, you are responsible for the safety recommendations detailed in all applicable codes and standards including:

- OSHA Regulations, Title 29-Labor, Chapter XVII, Section 1910.217, Mechanical Power Presses (Available at www.osha_slc.gov/OshStd–data/1910_0217.html)
- ANSI B11.1, American National Standard for Machine Tools, Mechanical Power Presses, Construction, Care, and Use (available from American National Standards Institute 1430 Broadway NY, NY 10018-3363 or http://web.ansi.org)
- NFPA No. 79, Electrical Standard for Metalworking Machine Tools
- IEC 61508, Part 1–7 Functional Safety of a PES Safety Related System
- EN 692 Mechanical Press Safety
- CAN/CSA-Z142-M90 Code for Punch Press and Brake Press Operation: Health, Safety, and Guarding Requirements (Canadian Standards Assoc. 178 Rexdale Blvd. Rexdale (Toronto) Ontario Canada M9W 1R3)

Other applicable standards include EN 954 and EN 60204

Also refer to *Important User Information* inside the front cover.

## Specifications

**Type of processor**
- pair of MicroLogix 1500 processors

**Type of power:**
- grounded ac (6556-MLCBK)
- dc (6556-MLCBKDC)

**Mode selections**
- off
- inch
- single stroke
- continuous
- micro inch

**Valve outputs**
- two clutch/brake valves

**Type of valves**
- internal fault detection

**Position monitoring inputs**
- two rotary cam limit switch assemblies

**Response time**
- 21 ms worst case
  from switched input to turned-OFF output

**Machine inputs**
- cycle stop
- E-stop

**Machine inputs (continued)**
- run station (1)
- mode select (rotary switch)
- clutch/brake air pressure
- motor forward interlock
- motion detector interlock
- arm for continuous on demand
- control reset
- C/B power reset

**Environmental conditions**
- Operating Temperature
  0 to 60°C (32 to 140°F)
- Storage Temperature
  –40 to 85°C (–40 to 185°F)
- Relative Humidity
  5 to 95% (without condensation)

**Designed to comply with**
- ANSI – B11.1
- OSHA – 1910.217
- CSA – CAN/CSA-Z142-M90
- NFPA No. 79

# Quick Start

Use this chapter as an abbreviated procedure for setting up the control, or as an overview if you need more information.

## Procedure

| | | |
|---|---|---|
| **1.** | **Verify That You have All of the Hardware Shipped in the Kit** | **this manual chapter 1** |

| Hardware Included | for -MLCBK | for -MLCBKDC | Hardware *That You Provide* |
|---|---|---|---|
| Micrologix 1500 Processor | 1764–LSP (2) | 1764–LSP (2) | |
| DC Base W/ DC 16IN/12OUT | 1764–28BXB (2) | 1764–28BXB (2) | • Input Switches and Run Stations (Application Dependent) |
| Memory Module w/ Real Time Clock | 1764–MMIRTC (2) | 1764–MMIRTC (2) | • Rotary Cam Limit Switches (2 sets) |
| 16 pt Input Module | 1769–IA16 (ac) (2) | 1769–IQ16 (dc) (6) | |
| 8 pt Input Module | 1769–IA8I (ac) (4) | | • Solenoid Valves (4) with Internal Fault Detection |
| 8 pt AC/DC Isolated Relay Module | 1769–OW8I (ac/dc) (4) | 1769–OW8I (ac/dc) (4) | |
| Compact I/O Terminator Cap RT | 1769–ECR (2) | 1769–ECR (2) | • Operator Interface (1) – PanelView 550 (6556-PV550) |

| | | |
|---|---|---|
| **2.** | **Mount the Network Interface Module and MicroLogix 1500 Base Unit (with processor and memory module pre–installed)** | **publications 1764–5.1 and 1761–5.11** |
| **3.** | **Wire the Power Supply on the MicroLogix 1500 Base Unit** | **publication 1764-5.1** |
| **4.** | **Wire the Network Interface Module DeviceNet (DNT) or Advanced Interface Convertor (AIC)** | **Publication 1761–5.11** |

| 5. | Install the Compact I/O Modules | this manual chapter 3 |
|---|---|---|

| Slot # | Controller A (same for Controller B) | Publication |
|---|---|---|
| n/a | MicroLogix 1500 Base Unit (1764–28BXB) with Processor (1747-LSP) and Memory Module w/ Real Time Clock (1764–MMIRTC) pre–installed | 1764–5.1 |
| 1 | Input Module 1769-IA16 (ac) or 1769-IQ16 (dc) | 1769–5.1 |
| 2 | Input Module 1769-IA8I (ac) or 1769-IQ16 (dc) | 1769–5.1 |
| 3 | Input Module 1769-IA8I (ac) or 1769-IQ16 (dc) | 1769–5.1 |
| 4 | AC/DC Isolated 8pt Relay Module 1769-OW8I | 1769–5.13 |
| 5 | AC/DC Isolated 8pt Relay Module 1769-OW8I | 1769–5.13 |
| n/a | Compact I/O Terminator Cap RT 1769–ECR | 1769–5.9 |

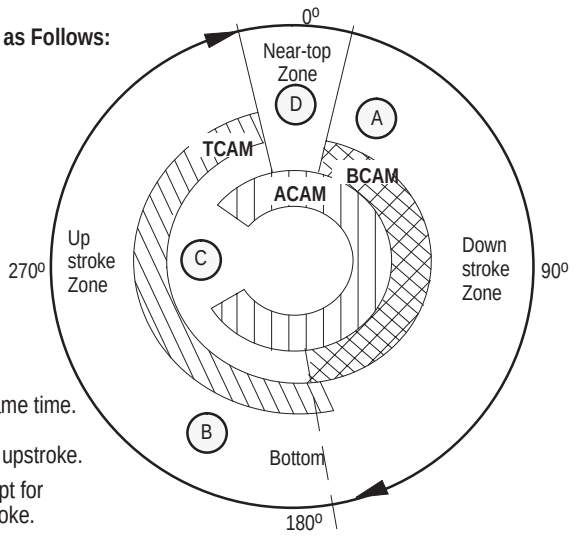
| 6. | Install Input Switches (You wire them in step 9.) | this manual chapter 1 |
|---|---|---|

| Description: | Type: |
|---|---|
| run station, inch/run | palm button |
| E-stop | |
| mode selection | rotary, key-lockable |
| cycle stop | push button |
| arm continuous | |
| E-stop reset | |
| C/B power reset | |
| main motor forward | N.O. single contact |
| motion detector | |
| air pressure | |

| 7. | Install Rotary Cam Limit Switches | this manual chapter 3 |
|---|---|---|

**Set Up or Simulate Rotary Cam Limit Switches as Follows:**

- (A) During downstroke, BCAM must be On.
- (B) During upstroke, TCAM must be On and BCAM must be Off.
- (C) During upstroke, ACAM must cycle from On to Off to On while TCAM is On.
- (D) Near top, BCAM and TCAM must be Off while ACAM remains On




**Other Conditions**:

The software is designed to fault if/when it detects:
a. ACAM, BCAM, and TCAM are OFF all at the same time.
b. BCAM is On when ACAM is Off.
c. ACAM does not cycle while TCAM is On during upstroke.

ACAM should remain On for the entire stroke except for an On/Off/On cycle while TCAM is On during upstroke.

Dual sets of contacts need not cycle at same moment. An offset of up to 1 second is acceptable.

**Important:** See press manufacturer's recommendations for on/off settings of ACAM, BCAM, and TCAM switches.

| 8. | Connect the Cables | this manual chapter 3 |
|---|---|---|

See the Installation Instructions that accompanied the Network Interface module for the terminations.

| Network Interface Module | Use this cable: | to connect: | notes: |
|---|---|---|---|
| DeviceNet | 1485C–PI–Cxxx Raw Drop Cable or equivalent | between DeviceNet Interface modules in controller A and controller B | see DeviceNet Interface module installation instructions in Publication 1761–6.5 |
| AIC+ Advanced Interface Converter | that you make | between AIC+ Advanced Interface Converters in controller A and controller B | see Advanced Interface Converter installation instructions in Publication 1761–6.5 |
| DeviceNet or AIC+ Advanced Interface Converter | 1761–CBL–AM00 | DeviceNet Interface Module to the MicroLogix 1500 | came with the DeviceNet Interface module, two required |

| 9. | Wire the I/O Modules, RCLS, and Input Switches | chapter 3 appendix C |
|---|---|---|

For wiring instructions, refer to chapter 3, Connections to I/O Modules, and to appendix C.

| 10. | Test the Wiring and Clutch/Brake Operation | chapters 4 and 5 |
|---|---|---|

For instructions on testing the wiring, refer to chapter 4.
For instructions on testing C/B operation, refer to chapter 5

**Notes:**

# Installing and Wiring

## Chapter Objective

In this chapter, we help you install the C/B control with these steps:

- check hardware
- mount the network interface and base unit
- wire the power supply
- wire the network interface module
- attach I/O modules
- set up rotary cam limit switches
- install input switches
- connect cables
- connections to I/O modules
- wire your control

## Check Hardware

To check the contents of the kit, refer to Contents of Kit in chapter 1. If items are missing, contact your local salesperson or distributor.

## Mount the Network Interface Modules and Base Units

To mount the network interface modules and base units:

| For | Refer To Publication |
|---|---|
| DeviceNet Interface Module (1761–NET–DNI) or Advanced Interface Converter, (1761–NET–AIC) Mounting Instructions | 1764-5.11 Installation Instructions for DeviceNet Interface Module (1761–NET–DNI) and Advanced Interface Converter (1761–NET–AIC) |
| MicroLogix 1500 Base Unit (Cat. No 1764–28BXB) mounting instructions | 1764–5.1 MicroLogix 1500 Programmable Controller Base Units Installation Instructions |

Look for these publications in the boxes that contain the network interface module and base units.

## Wire the Power Supply

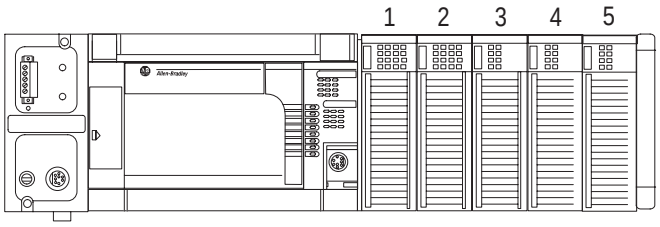
To wire the power supply contained in the base unit (Cat. No. 1764-28BXB), refer to publication 1764-5.1, MicroLogix 1500 Programmable Controller Base Units Installation Instructions. Look for this publication in the box that contains the base units.

## Wire the Network Interface Module

To wire the network interface module (DeviceNet Cat. No. 1761-NET–DNI or Advanced Interface Converter Cat. No 1761–NET–AIC), refer to publication 1761–5.11. Look for this publication in the box that contains network interface module. Keep the instruction sheet handy because you will use it to fabricate and connect cables.

## Attach the I/O Modules

Attach the I/O modules in designated sequence for MicroLogix 1500 A and MicroLogix 1500 B as follows:




| Location # | DC Controller A (same for controller B) | AC Controller A (same for controller B) |
|---|---|---|
| n/a | DeviceNet Interface Module (Cat. No. 1761–NET–DNI) or Advance Interface Converter (Cat. No. 1761–NET–AIC) (customer selection) | |
| n/a | MicroLogix 1500 Base Unit (Cat. No. 1761–28BXB) containing Processor (Cat. No. 1747-LSP) with Memory Module w/ Real Time Clock (Cat. No. 1764–MMIRTC) | |
| 1 | Compact 1769-IQ16 24V dc Sink/Source Input Module | Compact 1769-IA16 120V ac Input Module |
| 2 | Compact 1769-IQ16 24V dc Sink/Source Input Module | Compact 1769-IA8I 120V ac Input Module |
| 3 | Compact 1769-IQ16 24V dc Sink/Source Input Module | Compact 1769-IA8I 120V ac Input Module |
| 4 | Compact 1769-OW8I AC/DC Relay Output Module | |
| 5 | Compact 1769-OW8I AC/DC Relay Output Module | |
| n/a | Compact I/O Terminator Cap RT 1769–ECR | |

I/O modules can be attached to the base unit or an adjacent I/O module before or after mounting. For attaching or mounting I/O modules, refer to the following publications installation instructions for that specific module.

### For Attaching or Mounting Compact I/O Modules

| I/O Module | Refer to Publication |
|---|---|
| Compact 1769-IQ16 24V dc Sink/Source Input Module | 1769–5.3 |
| Compact 1769-IA16 120V ac Input Module | 1769–5.1 |
| Compact 1769-OW8I AC/DC Relay Output Module | 1769–5.13 |
| Compact RT 1769–ECR I/O Terminator Cap | 1769–5.9 |
| Compact 1769–IA8I 120V ac Input Module | 1769–5.12 |

## Set Up Rotary Cam Limit Switches

To set up rotary cam limit switches, set up the cam angles for each switch assembly as described below and according to the press manufacturer's installation instructions.

**Important:** Mount these assemblies on opposite ends of the crankshaft so a mismatch (fault) will occur if the crankshaft breaks.

- brake-monitor (BCAM) contacts close at a point that lets the system detect an increase in braking distance
- take-over (TCAM) contacts close at bottom to let the press complete a stroke, and open during upstroke to let the press stop at the top
- anti-repeat (ACAM) contacts limit press operation to a single stroke in single-stroke mode

| This Cam: | In this Mode: | With these Conditions: | Provides a Signal That: |
|---|---|---|---|
| Anti-Repeat (ACAM) | Inch, Micro Inch or Single stroke | Cams open and close in upstroke | Prevents a second stroke in these modes |
| Take-over (TCAM) | Inch, Micro Inch or Single stroke | Cams open in near-top zone | Turns OFF triac outputs for stopping the press at top of stroke (stop-on-top) |
| | Continuous | Cams open in near-top zone after stop-on-top command | |
| | Single stroke or Continuous | Cams close near bottom just when (or before) BCAM opens | Lets the press complete a single stroke or run continuously after run buttons are released |
| Brake-monitor (BCAM) | Single Stroke or Continuous | When press stops in downstroke beyond BCAM closure | Indicates that braking distance is excessive. Turns OFF solenoid outputs to prevent restart. |

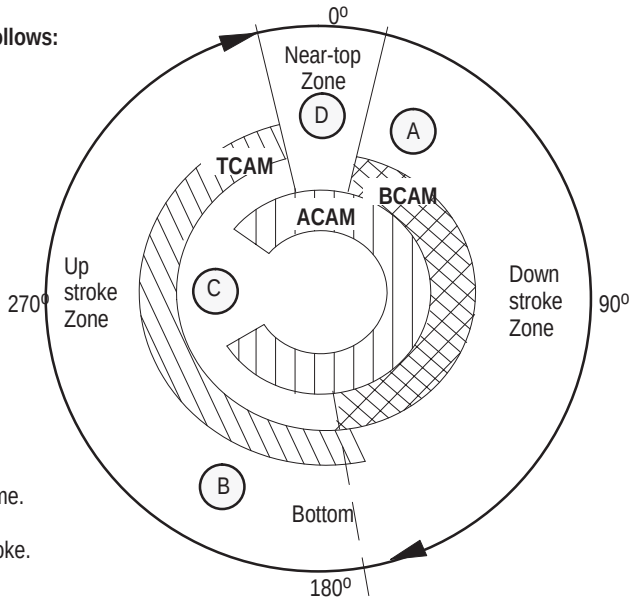
**Set Up or Simulate Rotary Cam Limit Switches as Follows:**

Ⓐ During downstroke, BCAM must be On.

Ⓑ During upstroke, TCAM must be On and BCAM must be Off.

Ⓒ During upstroke, ACAM must cycle from On to Off to On while TCAM is On.

Ⓓ Near top, BCAM and TCAM must be Off while ACAM remains On.




**Other Conditions**:

The software is designed to fault if/when it detects:
a. ACAM, BCAM, and TCAM are OFF all at the same time.
b. BCAM is On when ACAM is Off.
c. ACAM does not cycle while TCAM is On during upstroke.

ACAM should remain On for the entire stroke except for an On/Off/On cycle while TCAM is On during upstroke.

The dual sets of contacts need not cycle at the same moment. An offset of up to 1 second is acceptable.

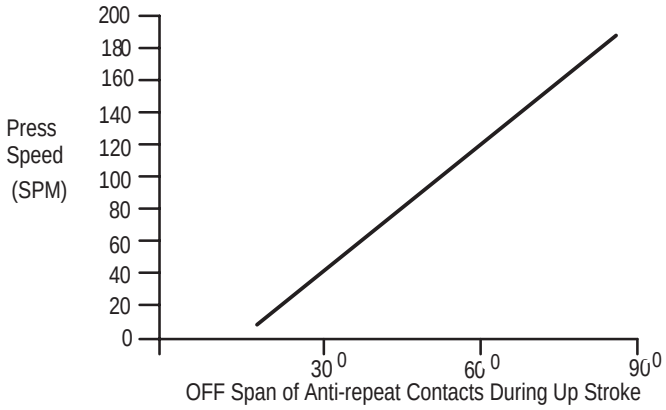
**Important:** See press manufacturer's recommendations for:
* Near-top Zone
* Bottom
* On/Off settings of ACAM, BCAM, and TCAM switches

As an example, we show typical ON/OFF settings for rotary cam limit switches in the following table where you can write down your initial settings.

| This RCLS: | Turns ON at a position: | Turns OFF at a position: | Typical ON OFF: | Your [1] ON OFF: |
|---|---|---|---|---|
| BCAM | • near top, beyond which the software detects a faulty brake | • when overlapped by TCAM in ON position | $10^{o}$ $190^{o}$ | |
| TCAM | • near bottom<br>• when or before BCAM turns OFF | • that lets the press stop correctly on top<br>• before BCAM turns ON | $170^{o}$ $350^{o}$ | |
| ACAM | • Remains ON for entire stroke except for an Off span during upstroke (see graph) | | $290^{o}$ $250^{o}$ | |

[1] **Important:** To determine exact settings, refer to recommendations provided by the press manufacturer.

Set the ACAM off span to the number of degrees ($0^{0}$ - $90^{0}$) according to the speed of the press (0-200 strokes per minute).




## Install Input Switches

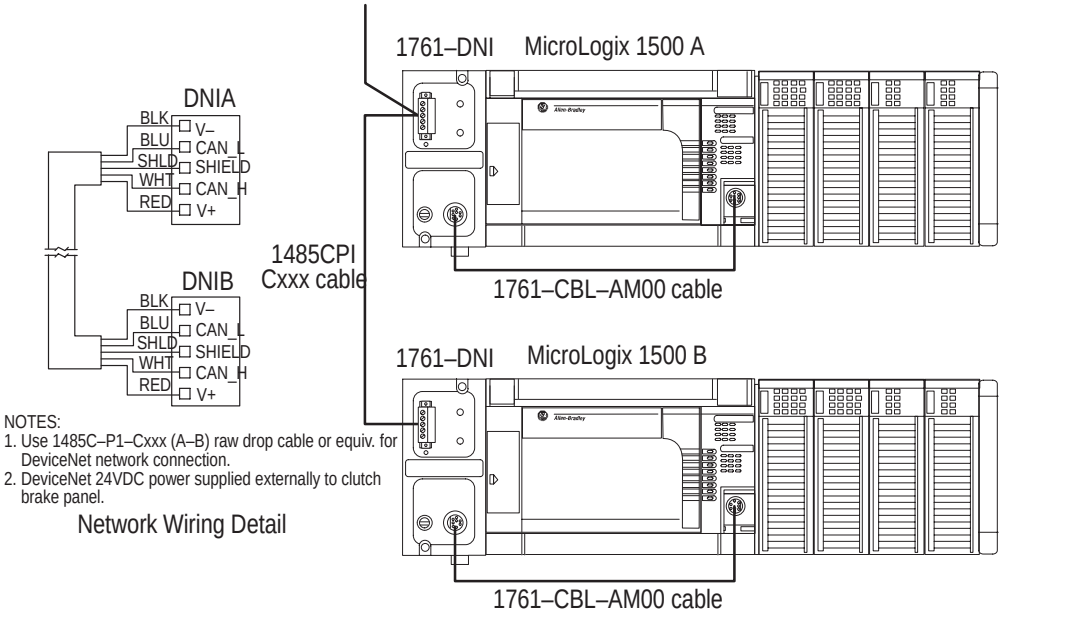
Verify that your press has the following switches. They are required inputs to your clutch/brake control. Refer to chapter 1 for switch specifications.

| Description: | Type: |
|---|---|
| run station, inch/run | palm button |
| E-stop | |
| mode selection | rotary, key-lockable |
| cycle stop | push button |
| arm continuous | |
| E-stop reset | |
| C/B power reset | |
| main motor forward | N.O. single contact |
| motion detector | |
| air pressure | |
| position monitor | rotary cam limit switches |

## Connect Cables

Connect cables as shown:. You must make the cable (1485CPI–PI–Cxxx) that connects between the two network interface modules. Refer to the Network Wiring Detail in each drawing. Use the 1761–CBL –AMOO cable to connect each interface module to the MicroLogix 1500.

### Cable Connections for DeviceNet Interface Module



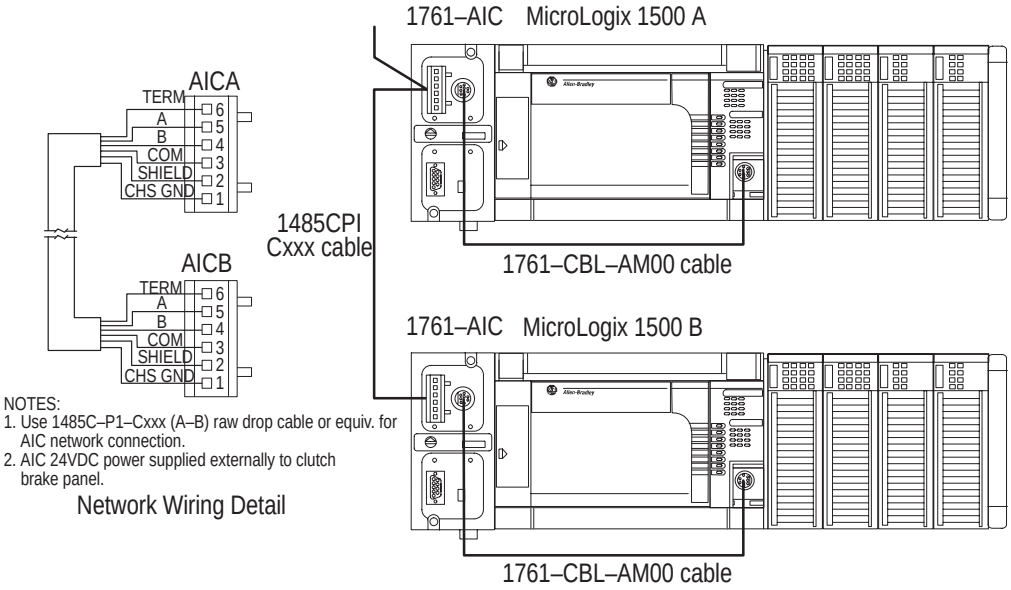

NOTES:
1. Use 1485C–P1–Cxxx (A–B) raw drop cable or equiv. for DeviceNet network connection.
2. DeviceNet 24VDC power supplied externally to clutch brake panel.

Network Wiring Detail

31060–M

| Connect Cable | Use this cable: | notes: |
|---|---|---|
| between DeviceNet Interface modules of MicroLogix 1500 A and MicroLogix 1500 B | 1485C–PI–Cxxx Raw Drop Cable or equivalent | see DeviceNet Interface module installation instructions in Publication 1761–6.5 |
| between DeviceNet Interface Module and the MicroLogix 1500 Base Unit | 1761–CBL–AM00 | came with the DeviceNet Interface module, two required |

## Cable Connections for Advanced Interface Converter




NOTES:
1. Use 1485C–P1–Cxxx (A–B) raw drop cable or equiv. for AIC network connection.
2. AIC 24VDC power supplied externally to clutch brake panel.

Network Wiring Detail

31061–M

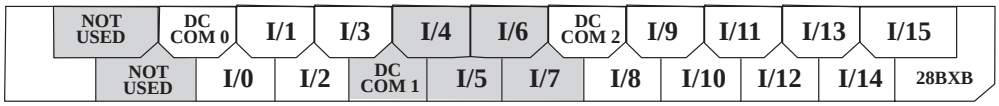
| Connect: Cable | Use this cable: | notes: |
|---|---|---|
| between Advanced Interface Converters (1761–NET–AIC) of MicroLogix 1500 A and MicroLogix 1500 B | that you make. Refer to Network Wiring Detail in drawing | see Advanced Interface Converter installation instructions in Publication 1761–6.5 |
| between Advanced Interface Converter (1761–AIC+) Interface Module and the MicroLogix 1500 Base Unit | 1761–CBL–AM00 | came with the Advanced Interface Converter, two required |

## Cross–Check Wiring

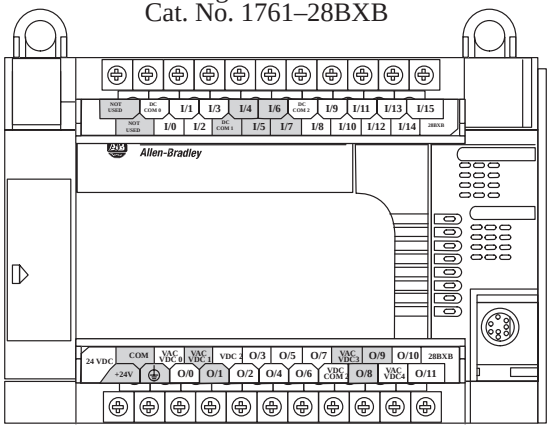
**Important:** Wiring between inputs of controller A of the 1761–28BXB Base Unit and outputs of controller B in the 1761-28BXB Base Unit provides cross-checking between controllers. With cross-check wiring, inputs to the base unit of controller A are wired to outputs in the base unit of controller B, and inputs to the base unit of controller B are wired to outputs in the base unit of controller A.

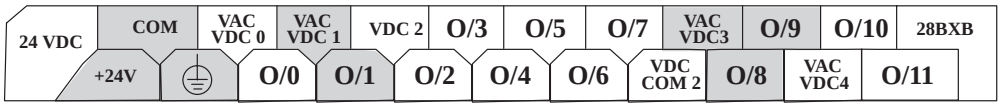
### MicroLogix 1500 Input and Output Block Layouts

Input Block Layout




MicroLogix 1500 Base Unit
Cat. No. 1761–28BXB

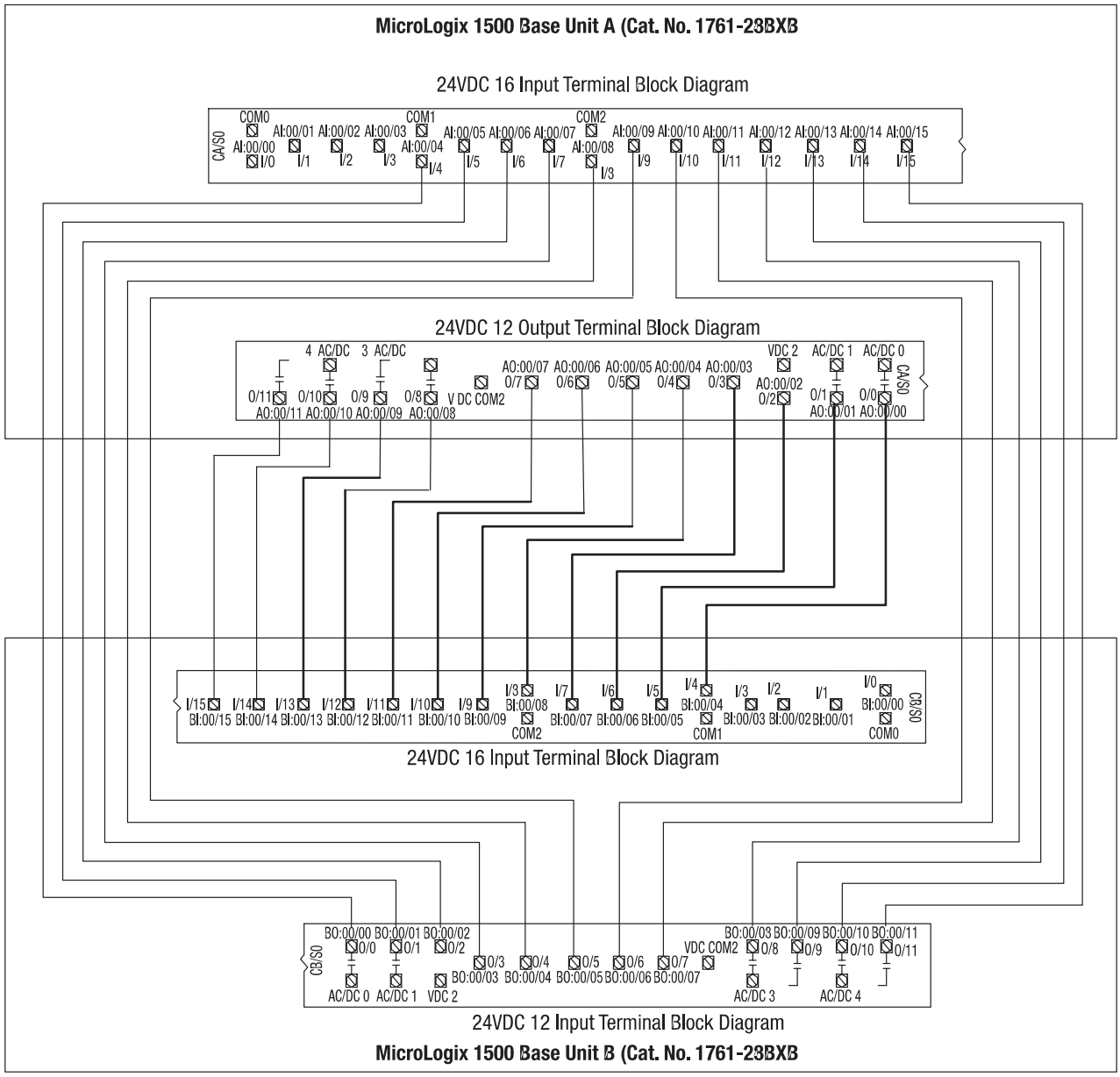



Output Block Layout

31059–M

## Cross Check Wiring Between Processors



## Cross Check Wiring Connection Tables

### Wiring Inputs Of Base Unit A To Outputs Of Base Unit B

| Base Unit A Input Module Terminal | Base Unit B Output Module Terminal | |
|---|---|---|
| I/4 | O/0 | Controller B Air Pressure |
| I/5 | O/1 | Controller B OK to Energize Seal |
| I/6 | O/2 | Controller B Clutch Output On |
| I/7 | O/3 | Controller B HeartBeat |
| I/8 | O/4 | Controller B Anti–Repeat CAM |
| I/9 | O/5 | Controller B Brake Monitor CAM |
| I/10 | O/6 | Controller B Takeover CAM |
| I/11 | O/7 | Spare |
| I/12 | O/8 | Controller B Mode (BCD Bit 1) |
| I/13 | O/9 | Controller B Mode (BCD Bit 2) |
| I/14 | O/10 | Controller B Mode (BCD Bit 3) |
| I/15 | O/11 | Main Motor Forward |

### Wiring Outputs Of Base Unit A To Inputs Of Base Unit B

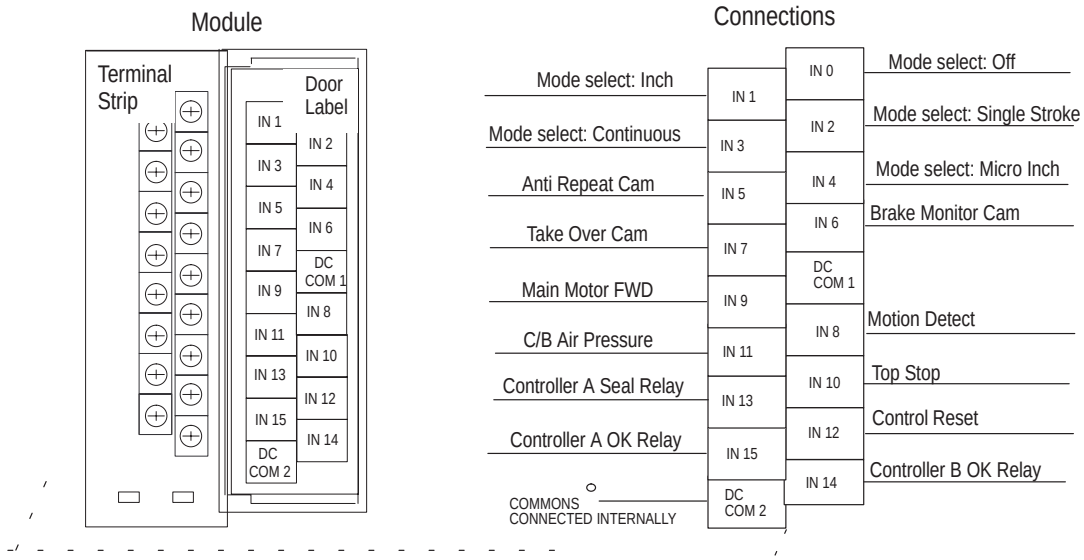
| Base Unit A Output Module Terminal | Base Unit B Input Module Terminal | |
|---|---|---|
| O/0 | I/4 | Controller A Air Pressure |
| O/1 | I/5 | Controller A OK to Energize Seal |
| O/2 | I/6 | Controller A Clutch Output On |
| O/3 | I/7 | Controller A HeartBeat |
| O/4 | I/8 | Controller A Anti–Repeat CAM |
| O/5 | I/9 | Controller A Brake Monitor CAM |
| O/6 | I/10 | Controller A Takeover CAM |
| O/7 | I/11 | Spare |
| O/8 | I/12 | Controller A Mode (BCD Bit 1) |
| O/9 | I/13 | Controller A Mode (BCD Bit 2) |
| O/10 | I/14 | Controller A Mode (BCD Bit 3) |
| O/11 | I/15 | Main Motor Forward |

## Connections to I/O Modules

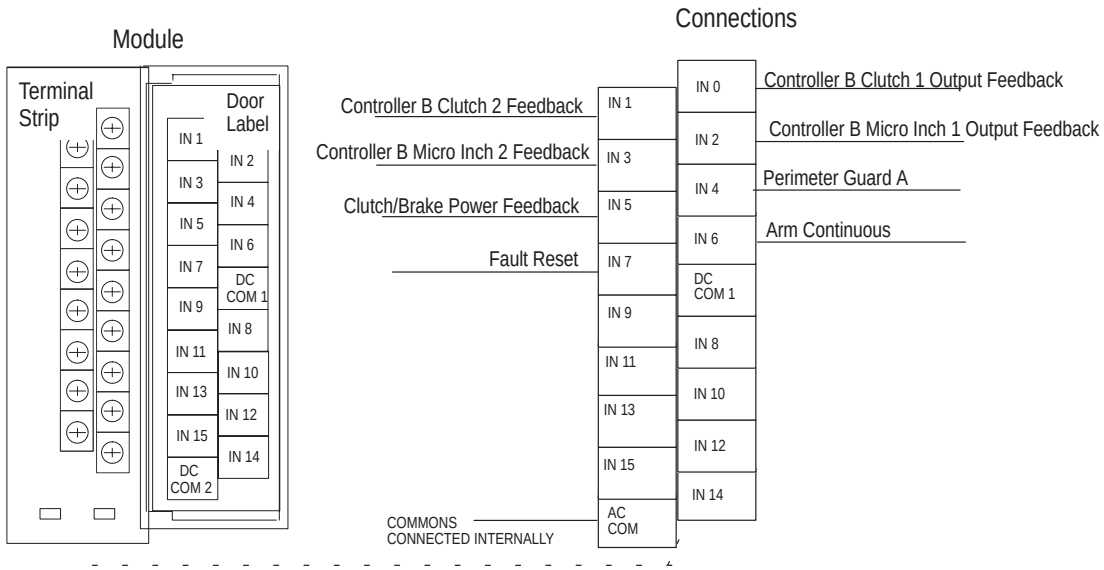
Each I/O module has a removable terminal block for wiring to I/O devices. The label inside the module door identifies the terminals. We present wiring call–outs for each I/O module. Refer to the B–size wiring drawings included in this kit. Modules attached to controllers A and B are wired the same except where noted.

### I/O Modules for DC Clutch/Brake Control

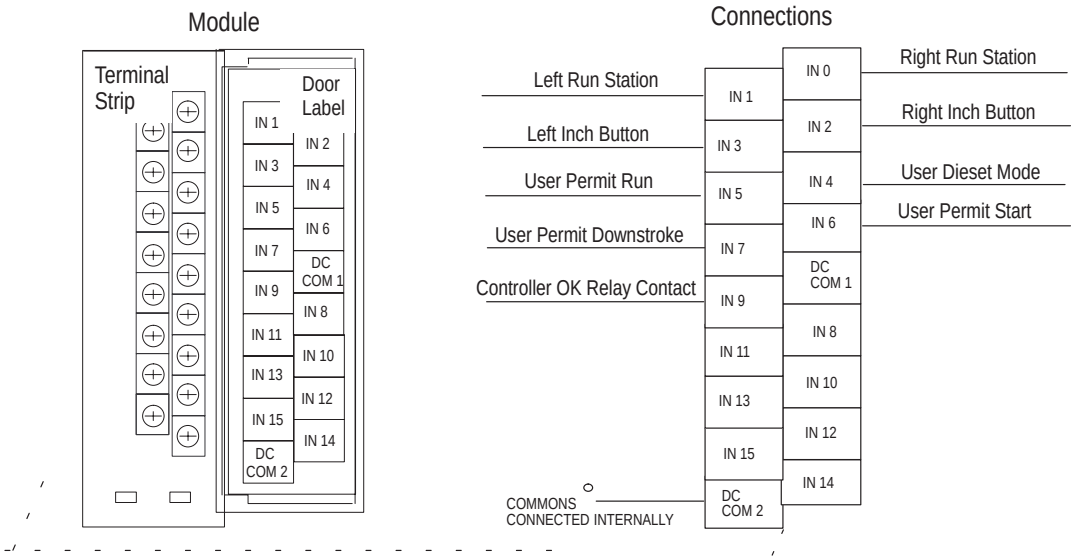
#### 1769-IQ16 (DC) in Slot 1



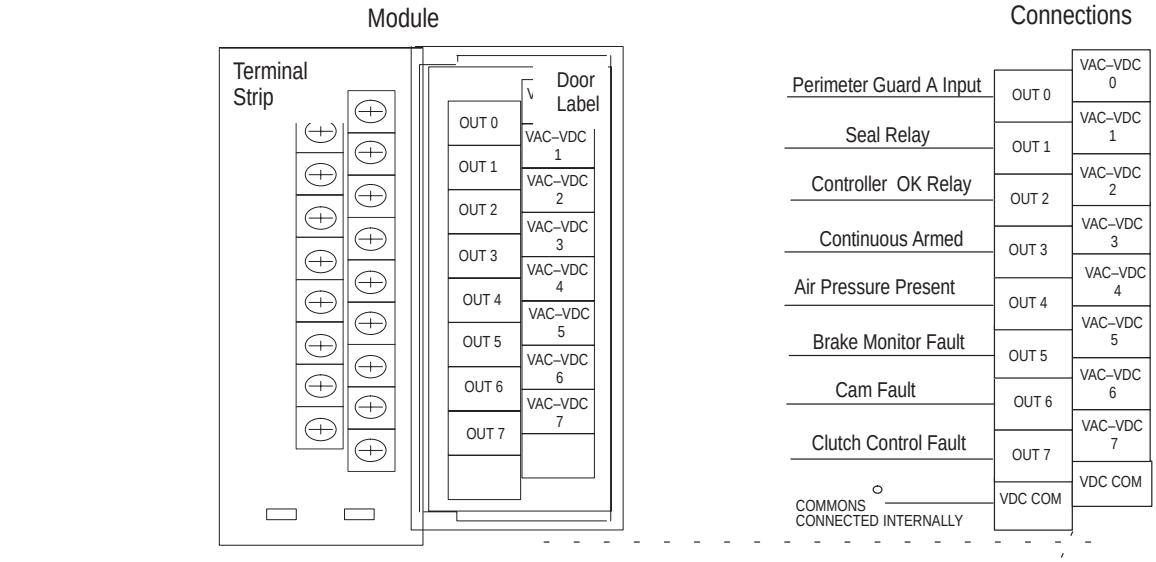

#### 1769-IQ16 (DC) in Slot 2



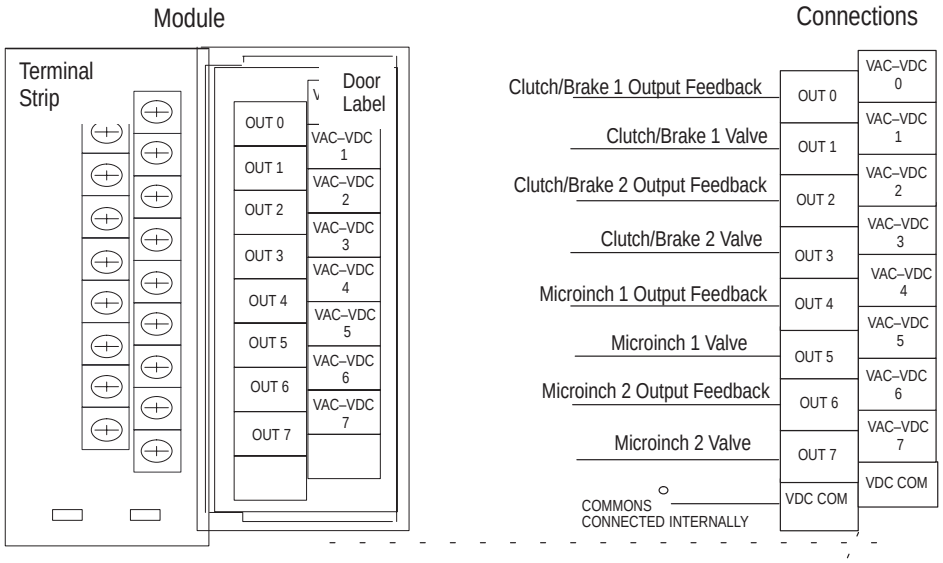
## 1769-IQ16 (DC) in Slot 3




## 1769-OW8I (AC or DC) in Slot 4

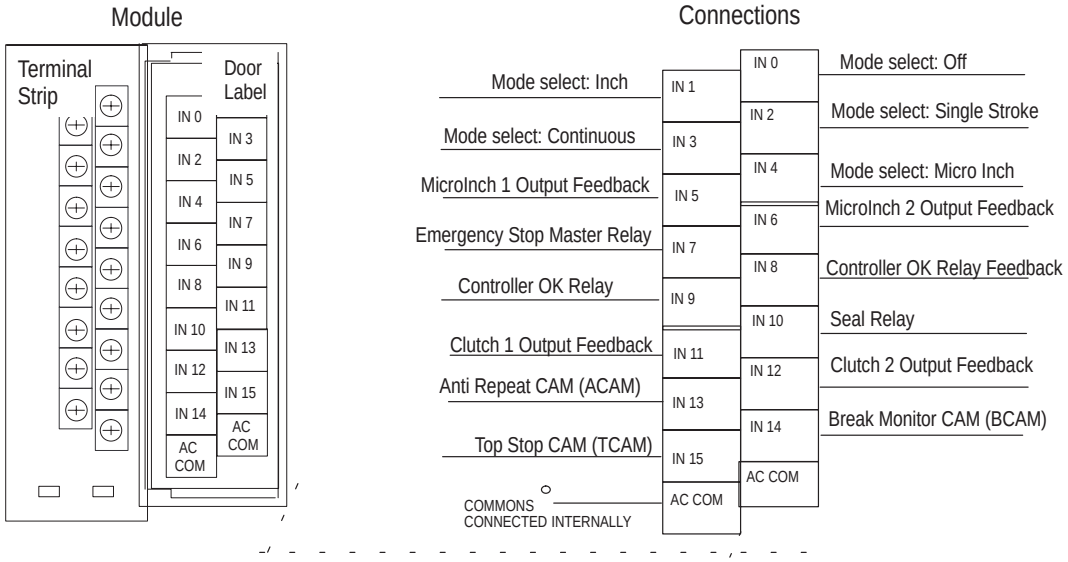


## 1769-OW8I (AC or DC) in Slot 5

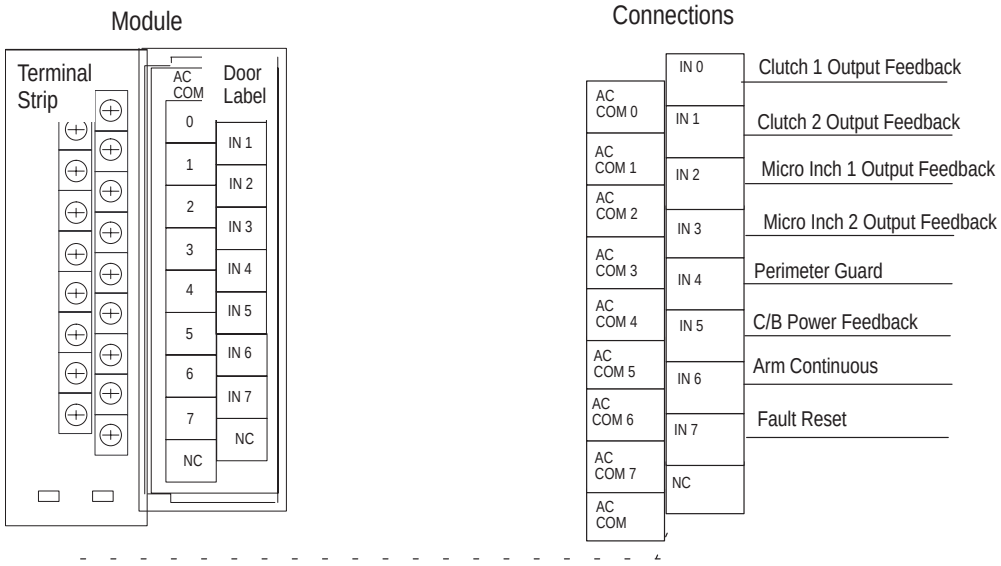



## I/O Modules for AC Clutch/Brake Control

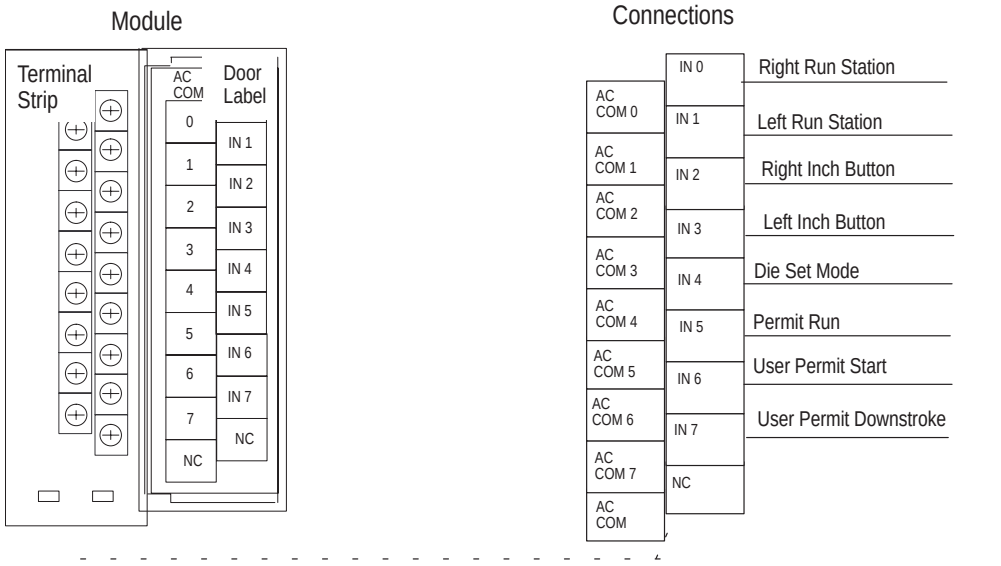
## 1769-IA16 (AC) in Slot 1



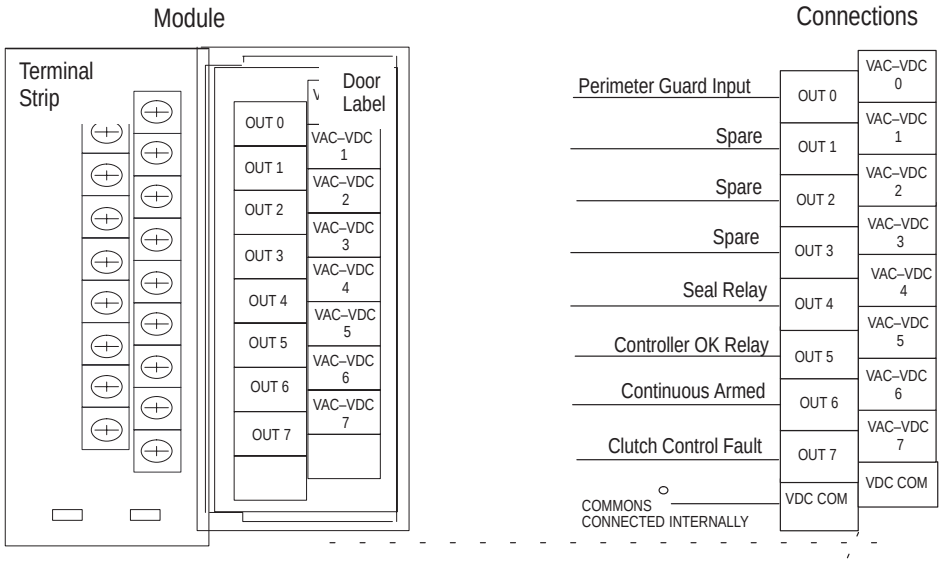
## 1769-IA8I (AC) in Slot 2



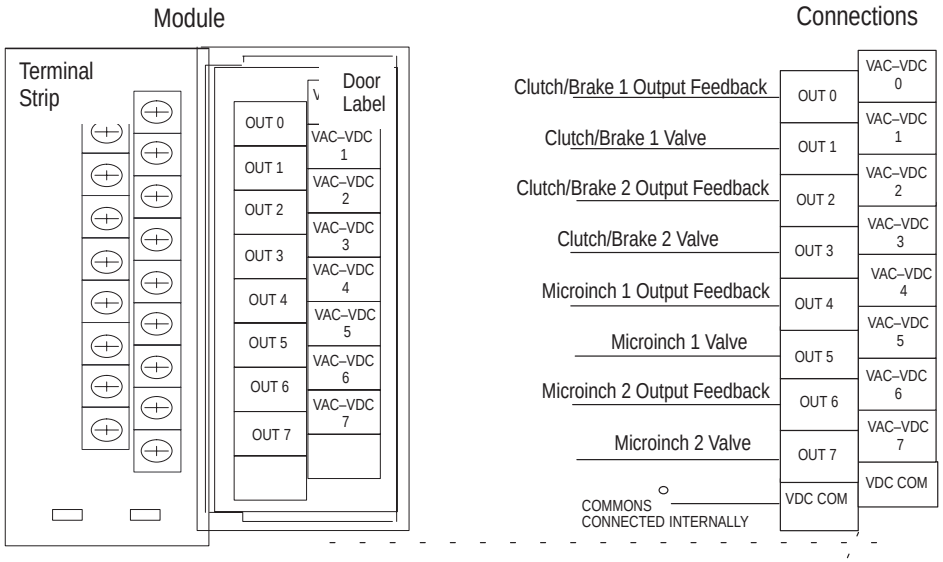

## 1769-IA8I (AC) in Slot 3



### 1769-OW8I (AC or DC) in Slot 4




### 1769-OW8I (AC or DC) in Slot 5




## Wire Your Control

We provide the same set of wiring drawings and user manual for both the ac and dc versions of this control. For the dc version (Cat. No. 6556-MLCKBDC), wire your I/O modules and dc power distribution according to those drawings.

**Important:** For the ac version (Cat. No. 6556-MLCBK), refer to appendix C for modifications you must make to the dc wiring drawings before wiring your I/O modules and power distribution.

Inputs and outputs by I/O module and location are as follows:

| For | In I/O Module Location | See Drawing Sheet |
|---|---|---|
| Power Distribution | Base unit | 1 of 10 |
| Inputs to 1764–28BXB base unit of Controller cross–checked inputs (same as cross–checked outputs, next) | Base unit | 2 of 10 |
| Outputs to 1764–28BXB base unit<br>Cross–checked Outputs<br>• OK To Energize Seal<br>• BCD Mode<br>• ACAM,BCAM,TCAM<br>• Clutch Output ON<br>• Heartbeat | Base Unit | 3 of 10 |
| Inputs to 1769–IQ16 (dc) or 1769–IA16 (ac)<br>• Mode Select<br>• ACAM, BCAM, TCAM<br>• Motion Detect<br>• Main Motor Forward<br>• Cycle Stop<br>• Clutch/Brake Air Pressure<br>• Emergency Stop Relay<br>• Seal Relay<br>• Controller OK Relays | Slot 1 | 4 of 10 |
| Inputs to 1769–IQ16 (dc) or 1769–IA8 (ac)<br>• Clutch/Brake 1 Feedback<br>• Clutch/Brake 2 Feedback<br>• Microinch 1 Feedback<br>• Microinch 2 Feedback<br>• Perimeter Guard<br>• Clutch/Brake Power Feedback<br>• Arm Continuous<br>• Fault Reset | Slot 2 | 5 of 10 |
| Inputs to 1769–IQ16 (dc) or 1769–IA8I (ac)<br>• Left & Right Run Station<br>• Left & Right Run Inch Buttons<br>• User Permits | Slot 3 | 6 of 10 |
| 1769–OW8I (dc or ac) Outputs<br>• Perimeter Guard<br>• Seal Relay<br>• Controller OK Relay<br>• Continuous Arm Light<br>• Air Pressure Light<br>• Brake Monitor Fault Light<br>• Cam Fault Light<br>• Clutch Control Fault Light | Slot 4 | 7 of 10 |
| 1769–OW8I (dc or ac) Outputs<br>• Clutch/Brake 1 Outputs<br>• Clutch/Brake 2 Outputs<br>• Microinch 1 Outputs<br>• Microinch 2 Outputs | Slot 5 | 8 of 10 |

Wire power supplies according to instructions that accompanied them.

## Notes:

# Customer Interface Inputs and Motion Detect Inputs

## Chapter Objective

Use this chapter to understand the customer interface inputs and motion detect inputs.

## Customer Interface Inputs

### Permit Run – I:03/05

The permit run input is used as a permissive to allow the press to run in inch, single stroke. or continuous mode. If the permit run input is “off”, the press will not be able to start motion. If the press is in motion it will stop immediately.

**Important:** If you are not using the permit run input, you must wire it high to allow the press to cycle.

### Permit Start – I:03/06

The permit start input is used as an initial condition to start the press cycle in single–stroke and continuous mode. The input must be “on” to start the press cycle. Once the press cycle starts, the permit start input is not required to be “on.”

**Important:** If you are not using the permit start input, you must wire it high to allow the press to cycle.

### Permit Downstroke – I:03/07

The permit downstroke input is required in inch, single stroke, and continuous as the last permissive in the logic to start the motion on the press. This permissive is in place after the inch or run buttons have been pressed. This allows the press to stop and restart as long as the operator keeps the inch or run buttons pressed.

**Important:** If you are not using the permit downstroke input, you must wire it high to allow the press to cycle.

### Dieset Mode – I:03/04

When turned “on”, the dieset mode input stops the press at the bottom. It stops at the top when in inch mode.

## Motion Detect Inputs

### Motion Detect – I:0/0

This motion detect input is a pulsed input. You should use this input if your motion detect device produces a square pulse output when it is in motion and no output when the press is stopped.

### Motion Detect – I:01/08

This motion detect input is a continuous input. You should use this input if your motion detect device produces a high signal when the press is in motion and a low signal when the press is stopped.

# Circuit Testing

## Chapter Objective

Once you have completed the installation of your clutch/brake control and wired your I/O devices, use this chapter to check circuit wiring.

**ATTENTION:** Before starting this chapter, be sure that:

- all clutch/brake control hardware is installed
- clutch/brake wiring is complete
- the control is in compliance with all applicable standards

Otherwise, personal injury or property damage could result.

## Testing Circuits and Failure-mode Operation

This section describes the following tests:

- Controller OK (failure mode)
- CRM Relay
- Seal Relay (circuit)
- Seal Relay (failure mode)
- Run Station Buttons
- Inch Buttons
- Cycle Stop Button
- Arm Continuous Button
- Mode Selector Switch
- Rotary Cam Limit Switches

### Controller OK Test (failure mode)

This test verifies the correct failure-mode operation of the Controller OK relay for controller A. You will repeat this procedure for controller B.

1. With power off, place a jumper across the wired contacts of Controller OK relay (CRAO0402).
2. Power up.
3. Press the C/B Control Reset button to energize the CRM relay.
4. Press (and momentarily hold) the C/B Power Reset button.
5. Verify that:
   – the Controller OK relay is NOT energized (red plunger is not recessed)
   – "Controller OK Check Failed" prompt is displayed on PanelView screen (or equivalent prompt code 003 is displayed on the DTAM display)
6. Shut off system power.
7. Remove the jumper.
8. Repeat steps 1-7 for Controller B (Controller OK relay CRBO0402).

### Safety Relay Test (circuit)

This test verifies that pressing the E-stop button will de-energize the seal and safety relays.

1. Power up.
2. Visually and with a voltmeter, verify that:
   – safety relay is *not* energized
   – outputs to all press valves are Off.
3. Reset the E-Stop circuit by pressing the Control Reset button.
4. Visually and with a voltmeter, verify that:
   – safety relay is energized
   – outputs to all press valves are Off
5. Reset control power by pressing the C/B Power Reset button.
6. With a voltmeter, verify that power rails to C/B outputs are energized.
7. Press the E-Stop button.
8. Visually and with a voltmeter, verify that seal relays and safety relay are de-energized.

### Seal Relay Test (circuit)

This test verifies that when the seal relay is off, press valves are off; and when the seal relay is on, outputs to press valves are energized.

1. Power up (if not already powered up).
2. Reset the E-Stop circuit by pressing the Control Reset button.
3. With a voltmeter, verify that:
   – seal relay is *not* energized
   – outputs to all press valves do are Off
4. Reset control power by pressing the C/B Power Reset button.
5. Visually and with a voltmeter, verify that:
   – seal relay is energized
   – power rails to C/B outputs are energized
6. Shut off system power.

### Seal Relay Test (failure mode)

This test verifies the correct failure-mode behavior of the seal relays for chassis A and B.

1. With power off, place a jumper across the wired contacts of seal relay (CRAO0401).
2. Power up.
3. Reset the E-Stop circuit by pressing the Control Reset button.
4. Verify that:
   – the seal relay is NOT energized
   – Controller OK relay is energized
   – “Seal Relay Weld Fault” prompt is displayed on PanelView (or Fault Code 005 is displayed on the DTAM display).
5. Shut off system power and *remove* the jumper.
6. Restore system power.
7. Reset control power by pressing the C/B Power Reset button.
8. Verify that:
   – safety relay is energized
   – there is NO fault message
9. Press (and momentarily hold) the C/B Power Reset button.
10. Verify that the seal relay is energized
11. Shut off system power.
12. Repeat steps 1–11 for chassis B (Seal Relay CRBO0401)

### Test Run Station Buttons

Test the wiring of Run Station buttons by observing LEDs in slot 3. Check each OK? box after verifying that the LED indication is correct.

| For This Condition | Slot 3, Controller A Input LED Is OFF | ON | OK? | Slot 3 Controller B Input LED Is OFF | ON | OK? |
|---|---|---|---|---|---|---|
| Right Run Station button is *pressed* | | Input 0 | | Input 1 | | |
| Left Run Station button is *pressed* | Input 1 | | | | Input 0 | |
| Both Run Station buttons *not* pressed | Input 0 | Input 1 | | Input 0 | Input 1 | |

### Test Inch Buttons

Test the wiring of Inch buttons by observing LEDs in slot 3. Check each OK? box after verifying that the LED indication is correct.

| For This Condition | Slot 3, Controller A Input LED Is OFF | ON | OK? | Slot 3 Controller B Input LED Is OFF | ON | OK? |
|---|---|---|---|---|---|---|
| Right Inch button is *pressed* | | Input 2 | | Input 3 | | |
| Left Inch button is *pressed* | Input 3 | | | | Input 2 | |
| Both Inch buttons *not* pressed | Input 2 | Input 3 | | Input 2 | Input 3 | |

### Cycle Stop and Arm Continuous Buttons

Test the wiring of these buttons by observing input LEDs.
Check each OK? box after verifying that the LED indication is correct.

| Slot | For This Condition | Verify both A and B Chassis Slot 2 Input LED Is OFF | ON | OK? |
|---|---|---|---|---|
| 1 | Cycle Stop *not* pressed | | Input 10 | |
| 1 | Cycle Stop pressed | Input 10 | | |
| 2 | Arm Continuous *not* pressed | Input 6 | | |
| 2 | Arm Continuous pressed | | Input 6 | |

## Test Mode Selector Switch

Test the wiring of this switch by observing input LEDs in slot 1. Check each OK? box after verifying that the LED indication is correct.

| For This Mode-select Position | | Slot 1 Input LEDs Are OFF | Slot 1 Input LED Is ON | OK? |
|---|---|---|---|---|
| Off | (input 0) | A & B: Inputs 0, 1, 2, 3, 4, except for the selected input | A & B, only the selected input | |
| Inch | (input 1) | | | |
| Single | (input 2) | | | |
| Continuous | (input 3) | | | |
| Micro Inch | (Input 4) | | | |

## Test Rotary Cam Limit Switches

Test the wiring of the RCLSs by observing input LEDs in slot 1. Check each OK? box after verifying that the LED indication is correct.

| For This Condition | Slot 1 Input LED Is OFF | ON | OK? |
|---|---|---|---|
| ACAM, BCAM, TCAM at rest | A & B, Inputs 5, 6, 7 | | |
| ACAM, BCAM, TCAM actuated | | A & B, Inputs 5, 6, 7 | |

## Notes:

# Testing the Operation

## Chapter Objective

Once you have checked the wiring of your clutch/brake control, use this chapter to test its operation. Tests include:

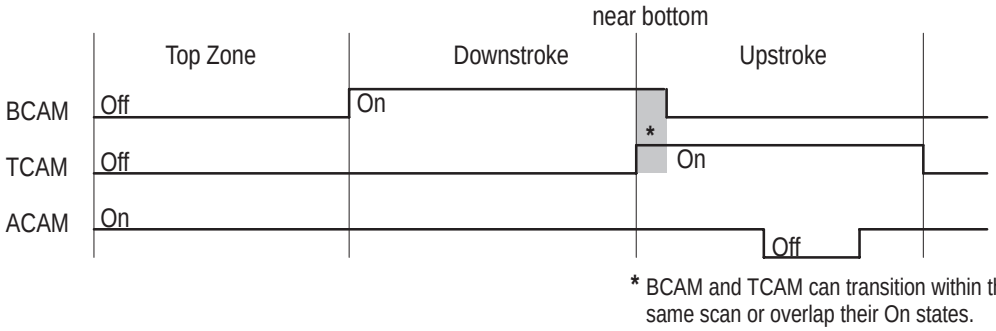
- troubleshoot the setup of your RCLS assemblies
- tests the operating modes
- test the switches

## Troubleshooting the Setup of Your RCLS Assemblies

We recommend that you test the rotary cam limit switches (RCLS) in Inch mode. The processor monitors RCLS signals to ensure that the motion progresses through the correct sequence of:

- downstroke
- upstroke
- top zone

During each stroke, rotary cam limit switches must cycle through these zones.




**Important:** The software reads the zones according to the on/off status of ACAM, BCAM, and TCAM switches that you set mechanically. When the software detects any one of the following fault conditions, it is designed to turn outputs off and set the corresponding fault message #.

Use the following look-up table to take corrective action.

### Processor Faults

| Msg # | PanelView Message | Cause of Fault | Effect of Fault | How to Correct the Fault |
|---|---|---|---|---|
| 027* | Illegal RCLS Combination | Software/hardware cams produced invalid combination. | Press will stop or not run in single or continuous mode. | Check software cam logic or hardware cams for proper operation or settings. |
| 028* | Forward Transition from Top | Software/hardware cams did not go from near top to downstroke. | | |
| 029* | Forward Transition from Downstroke | Software/hardware cams did not enter upstroke. | | |
| 030* | Forward Transition from Upstroke | Software/hardware cams did not enter near top zone. | | |
| 034* | Forward Shaft Position Transition Faults | Any of 027-030 detected. | | |
| 035* | ACAM Upstroke | ACAM did not cycle in upstroke. | | |
| 042* | BCAM Mismatch Between Processors | One processor sees the BCAM while the other does not. | | |
| 043* | TCAM Mismatch Between Processors | One processor sees the TCAM while the other does not. | | |
| 044* | ACAM Mismatch Between Processors | One processor sees the ACAM while the other does not. | | |
| 045* | Cam Mismatch Faults | Any of 042-044 detected. | | |
| 047* | Brake Monitor Fault | On a top-stop command, the press slid onto BCAM before stopping. | Press cannot operate in single or continuous mode. | Check the brake and brake monitor cam settings. |

* To clear this latched fault bit, you must enable the fault reset bit or turn the mode-select switch to OFF.

## Test the Operating Modes

Here are procedures to test dynamic operation of the press in these modes:

- inch
- single-stroke
- continuous with the arm-continuous method to start this mode
- micro inch

**Important:** If the press control faults or does not operate as expected, read the fault or prompt message (or bit number) and see Appendix B for:

- faults in bit file B168 for troubleshooting
- prompts in bit file B169 for operating the press

### Inch Mode

1. Place the mode selector switch in Inch mode.
2. Power up by pressing the Control Reset and C/B Power Reset buttons.
3. Verify that seal relays and CRM relays are energized.
4. Concurrently, press and hold both Inch buttons.
5. Observe that the press cycles and stops on top.

6. Release the Inch buttons and press again for 1-2 seconds.
7. Observe that the press cycles until you release a button, then stops.

### Single-stroke Mode

1. Place the mode selector switch in Single-stroke mode.
2. Press and hold Run buttons for more than 1/2 stroke.
3. Observe that the press cycles and stops on top.
4. Release Run buttons and press again. Then release in downstroke.
5. Observe that the press stops immediately.
6. Bring the press to top by pressing Run buttons and release in upstroke.
7. Repeat steps 2 and 3. This time hold Run buttons for the entire cycle.
8. Observe that the press runs through one stroke and stops at the top.

### Continuous Mode with Arm Continuous

1. Place the mode selector switch in Continuous mode.
2. Press the Arm Continuous button.
3. Immediately press Run buttons and release after downstroke.
4. Observe that the press continues to cycle.
5. Press the Cycle Stop button.
6. Observe that the press completes the cycle and stops on top.
7. Return to step 2 and press the Arm Continuous button.
   This time, wait for 5 seconds (or until the Arm-continuous timer has timed out) before pressing Run buttons.
8. Observe that the press does not start.
9. Repeat steps 2 through 6 for a final verification.

### Micro Inch Mode

1. Place the mode selector switch in Micro Inch mode.
2. Power up by pressing the Control Reset and C/B Power Reset buttons.
3. Verify that seal relays and CRM relays are energized.
4. Concurrently, press and hold both Inch buttons.
5. Observe that the press cycles and stops on top.

6. Release the Inch buttons and press again for 1-2 seconds.
7. Observe that the press cycles until you release a button, then stops.

## Test the Switches

Test the following switches with an operating clutch/brake control:

- C/B air pressure
- motion detector
- main motor forward

### C/B Air Pressure Switch

1. Remove the C/B air pressure switch input from chassis A at slot 1 – terminal 11.
2. Place the mode selector switch in single-stroke mode.
3. Attempt to start the press and observe that it does not start.
4. Reconnect the air pressure switch input to chassis A (step 1).
5. Remove the switch input from chassis B (slot 1 – terminal 11) to repeat the test.
6. Attempt to start the press and observe that it does not start.
7. Reconnect the air pressure switch input to chassis B (step 5).

### Motion Detector Switch

1. Remove the motion detector switch input from chassis A at slot 1 – terminal 8.
2. Place the mode selector switch in Single-stroke mode.
3. Start the press and observe that it stops before reaching bottom. If the press reaches bottom, the circuit is not functioning correctly.
4. Reconnect the motion detector switch input to chassis A (step 1).
5. Remove the switch input from chassis B (slot 1 – terminal 8) to repeat the test.
6. Start the press and observe that it stops before reaching bottom.
7. Reconnect the switch input to chassis B (step 5).

### Main Motor Forward Switch

1. Remove the main motor forward switch input from chassis A at slot 1 – terminal 9.
2. Place the mode selector switch in Single-stroke mode.
3. Attempt to start the press and observe that it does not start.
4. Reconnect the main motor forward switch input.
5. Remove the switch input from chassis B (slot 1 – terminal 9) to repeat the test.
6. Repeat steps 3 and 4.

## Notes:

# Description of Operating Modes

## Clutch/Brake Operating Modes

You can select any one of the following operating modes with the mode selector switch:

- Off
- Inch
- Single stroke
- Continuous stroking
- Micro Inch

### Off

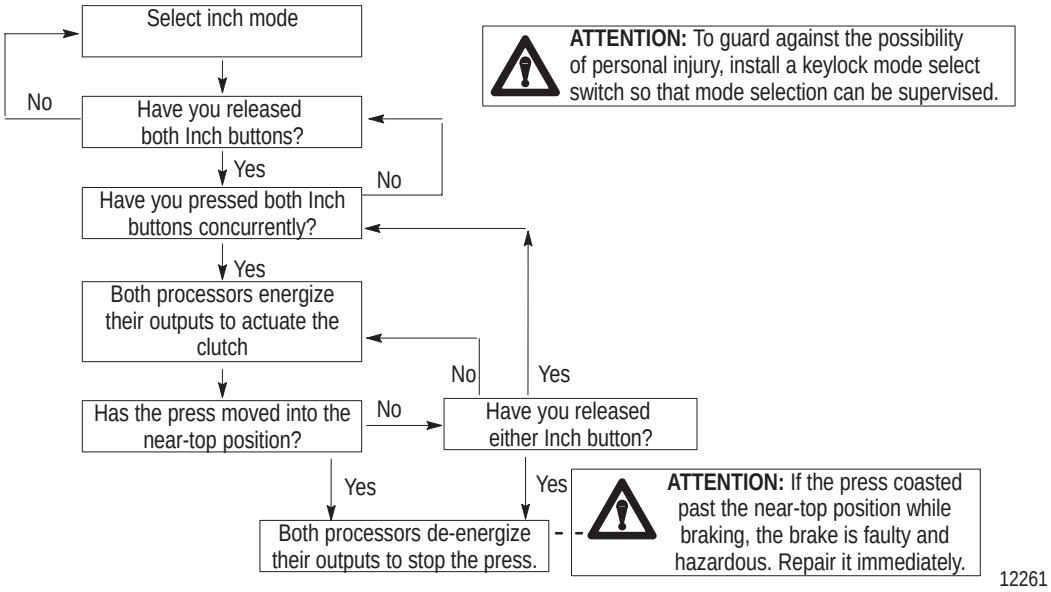
When an operator selects OFF, the control system is designed to:

- turn off all outputs to press valves.
- reset faults

### Inch Mode

Before entering single or continuous mode, use inch mode to jog the press to the near-top position to set up the machine. The press stops when it moves into the near-top position or when you release a Inch button (Figure A.1).

**Figure A.1**
**Typical Operational Sequence for Inch Mode**


Select inch mode
No
Have you released both Inch buttons?
Yes
No
Have you pressed both Inch buttons concurrently?
Yes
Both processors energize their outputs to actuate the clutch
No
Yes
Has the press moved into the near-top position?
No
Have you released either Inch button?
Yes
Yes
Both processors de-energize their outputs to stop the press.
ATTENTION: To guard against the possibility of personal injury, install a keylock mode select switch so that mode selection can be supervised.
ATTENTION: If the press coasted past the near-top position while braking, the brake is faulty and hazardous. Repair it immediately.
12261

## Single Stroke Mode

Single stroke mode is designed to stroke the press once, from top to bottom to top, with the concurrent use of the Run buttons. Once the press reaches the takeover cam (TCAM), the operator can release the Run buttons without stopping the press. It continues to the near-top position.

In downstroke, releasing a Run button stops the press (Figure A.2). Then, if the press did not enter the upstroke zone (TCAM On), you may resume downstroke by again pressing Run buttons.

Once the press reaches the takeover cam (TCAM), the press continues automatically through the upstroke (Figure A.3).

**Figure A.2**
**Typical Operational Sequence for Downstroke in Single Mode**

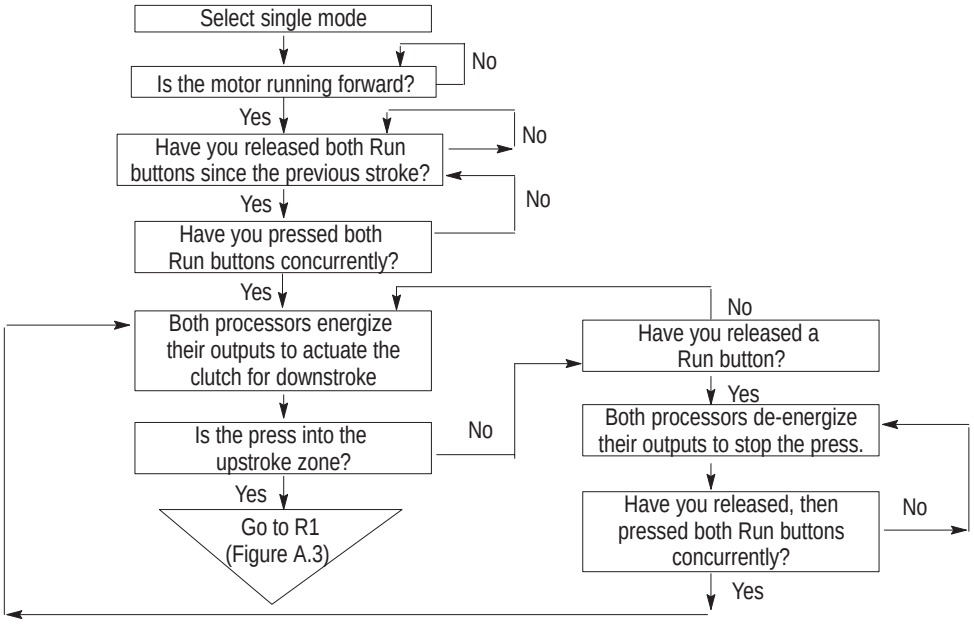
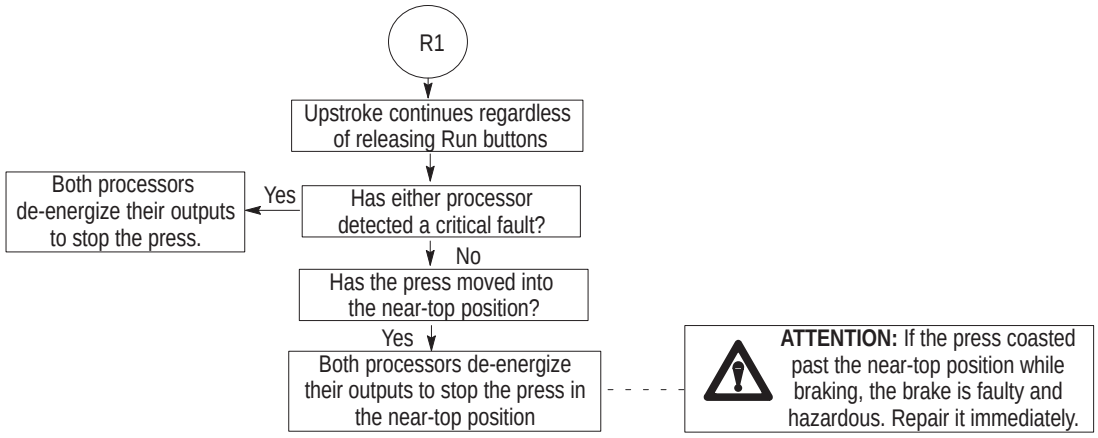

Select single mode
Is the motor running forward?
No
Yes
Have you released both Run buttons since the previous stroke?
No
Yes
Have you pressed both Run buttons concurrently?
No
Yes
Both processors energize their outputs to actuate the clutch for downstroke
Is the press into the upstroke zone?
No
Yes
Go to R1 (Figure A.3)
Have you released a Run button?
Yes
Both processors de-energize their outputs to stop the press.
Have you released, then pressed both Run buttons concurrently?
No
Yes

**Figure A.3**
**Typical Operational Sequence for Upstroke in Single Mode**


R1
Upstroke continues regardless of releasing Run buttons
Has either processor detected a critical fault?
Yes
Both processors de-energize their outputs to stop the press.
No
Has the press moved into the near-top position?
Yes
Both processors de-energize their outputs to stop the press in the near-top position
ATTENTION: If the press coasted past the near-top position while braking, the brake is faulty and hazardous. Repair it immediately.

## Continuous Mode with Arm Continuous

To run your press continuously, ready the press as follows:

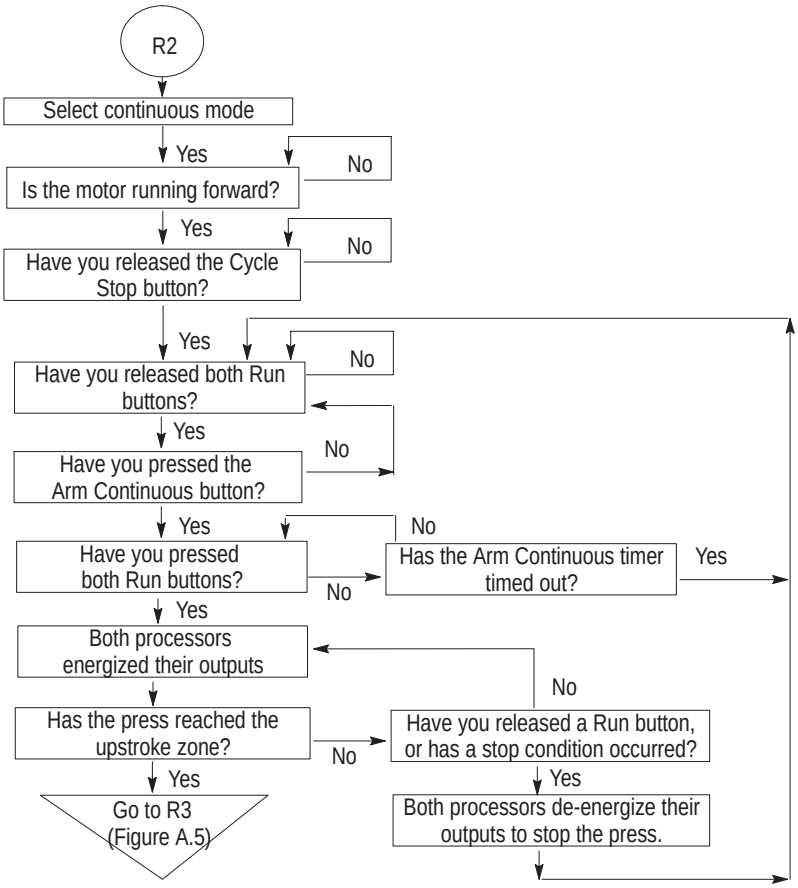
- select continuous mode
- press the arm continuous button
- press both Run buttons within 5 seconds

During the first downstroke (Figure A.4), releasing a Run button stops the press. Then, if the press did not enter the upstroke zone (TCAM still off), you may resume downstroke within 5 seconds if you release and press both Run buttons again. If 5 seconds passes and the press stops, you must press the Arm Continuous button and Run buttons again to restart.

During the first upstroke (Figure A.4) when TCAMs come on, you may release Run buttons and the press will continue stroking. If you start the press in upstroke, you must press the Arm Continuous button and then hold Run buttons for a complete cycle until next upstroke.

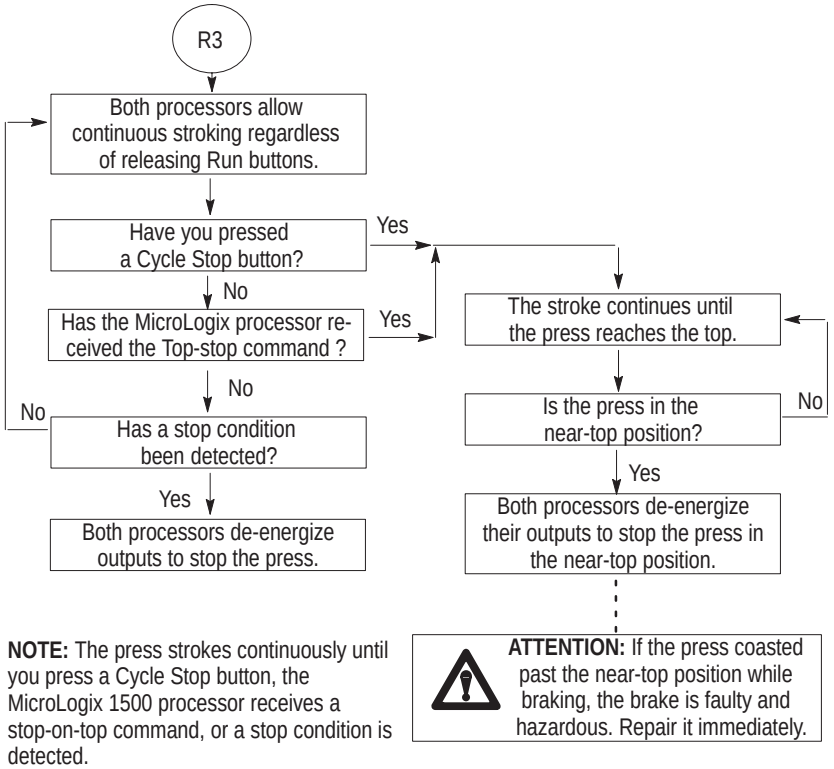
Once in continuous stroking operation (Figure A.5), the press stops at the next near-top position whenever it receives a stop-on-top command. However, the press stops immediately whenever either processor detects a trip or stop condition or a required condition is removed.

**Figure A.4**
**Typical Operational Sequence to Start Continuous Mode**




**NOTE:** Releasing a Run button during first downstroke stops the press. If the slide has not entered the upstroke zone, you can resume downstroke within 5 seconds of pressing the Arm Continuous button. After 5 seconds (and the press is stopped), you must restart continuous mode with the arming sequence.

**Figure A.5**
**Typical Operational Sequence for Continuous Stroking**

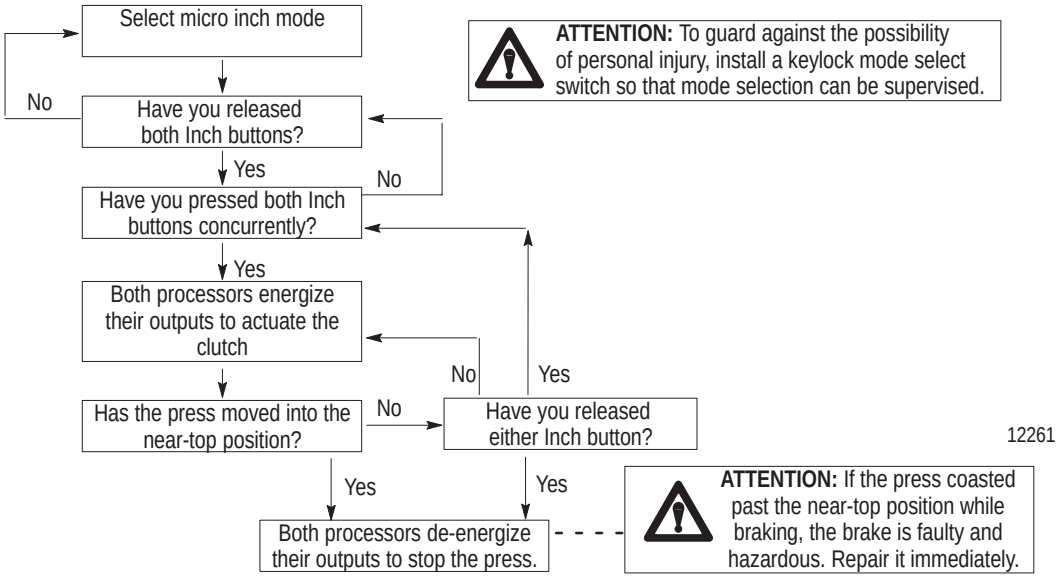

R3
Both processors allow continuous stroking regardless of releasing Run buttons.
Have you pressed a Cycle Stop button?
Yes
No
Has the MicroLogix processor received the Top-stop command ?
Yes
No
Has a stop condition been detected?
No
Yes
Both processors de-energize outputs to stop the press.
The stroke continues until the press reaches the top.
Is the press in the near-top position?
No
Yes
Both processors de-energize their outputs to stop the press in the near-top position.
ATTENTION: If the press coasted past the near-top position while braking, the brake is faulty and hazardous. Repair it immediately.

**NOTE:** The press strokes continuously until you press a Cycle Stop button, the MicroLogix 1500 processor receives a stop-on-top command, or a stop condition is detected.

## Micro Inch Mode

Before entering single or continuous mode, use micro inch mode to jog the press to the near-top position to set up the machine. The press stops when it moves into the near-top position or when you release a Inch button (Figure A.6).

**Figure A.1**
**Typical Operational Sequence for Inch Mode**


Select micro inch mode
ATTENTION: To guard against the possibility of personal injury, install a keylock mode select switch so that mode selection can be supervised.
No
Have you released both Inch buttons?
Yes
No
Have you pressed both Inch buttons concurrently?
Yes
Both processors energize their outputs to actuate the clutch
No
Yes
Has the press moved into the near-top position?
No
Have you released either Inch button?
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Yes
Yes
ATTENTION: If the press coasted past the near-top position while braking, the brake is faulty and hazardous. Repair it immediately.
Both processors de-energize their outputs to stop the press.

## Notes:

# Processor Faults and Operator Prompts

## Fault Codes for Troubleshooting

Whenever a MicroLogix processor detects a fault, it sets a corresponding Fault # or PanelView message. We list the conditions for which the software is designed to detect and signal faults. Fault #s (read from the data table) are independent of interface module used.

For message #s, use the following table to look up the Fault # and respond to the fault.

### Processor Faults

| Fault # | Fault Description | Cause of Fault | Effect of Fault | How to Correct the Fault |
|---|---|---|---|---|
| 001 | PLC HeartBeat Failed | Processor failure. | C/B power is de–energized. | Troubleshoot processor to determine cause of failure. |
| 002-003 | Spare | | | |
| 004* | Processor OK Relay check | Controller OK relay failed to close. | C/B power will not turn ON. | Check Controller OK relay and wiring. Check operation of input module in slot 2. |
| 005* | Seal Relay failed to turn on | Seal relay A failed to close. | C/B power will not turn ON. | Check seal relay and wiring. Check operation of input module in slot 1 |
| 006* | Seal Relay failed to turn off | Seal relay A welded closed. | C/B power is de-energized and will not turn ON. | Check seal relay and wiring. Check operation of input module in slot 1. |
| 007* | E-Stop Relay failed to Turn ON. | E-Stop relay failed to close. | C/B power will not turn ON. | Check E-Stop CRM relay circuit. Check operation of input module in slot 1. |
| 008* | E-Stop Relay failed to turn OFF. | CRMA relay welded closed. | C/B power is de-energized and will not turn ON. | Check E-Stop CRM relay circuit. Check operation of input module in slot 1. |
| 009 | No Valid Clutch/Brake Mode | Mode-select failed. | C/B power will not turn ON. | Check mode selector switch and wiring. Check operation of input module in slot 1. |
| 0010* | C/B Mode Mismatch between processors | Each processor sees a different mode. | Press will not stroke. | Check mode selector switch and wiring. Check operation of input module in slot 1. |
| 011-014 | Spare | | | |
| 015 | Run Station Tiedown | Time between pressing Run/inch buttons was too long. | Press will not start a stroke in single or continuous mode. | Release, then press run buttons simultaneously. Check button wiring. |
| 016-024 | Spare | | | |
| 025 | Inch Button Tiedown | Time between pressing Run/inch buttons was too long. | Press will not inch. | Release, then press inch buttons simultaneously. Check button wiring. |
| 026 | Spare | | | |
| 027* | Illegal Cam Combination | Software/hardware cams produced invalid combination. | Press will stop or not run in single or continuous mode. | Check software cam logic or hardware cams for proper operation or settings. |
| 028* | Slide Transitioned from Top Zone to Upstroke | Software/hardware cams did not go from top to downstroke. | Press will stop or not run in single or continuous mode. | Check software cam logic or hardware cams for proper operation or settings. |
| 029* | Slide Transitioned from Downstroke to Top Zone | Software/hardware cams did not enter upstroke. | Press will stop or not run in single or continuous mode. | Check software cam logic or hardware cams for proper operation or settings. |
| 030* | Slide Transitioned from Upstroke to Downstroke | Software/hardware cams did not enter near top zone. | Press will stop or not run in single or continuous mode. | Check software cam logic or hardware cams for proper operation or settings. |
| 031-033 | Spare | | | |
| * To clear this latched fault bit, you must enable the fault reset bit or turn the mode-select switch to OFF. | | | | |
| 034* | Forward Shaft Position Transition Faults | Any of 027-030 detected. | Press will stop or not run in single or continuous mode. | Check software cam logic or hardware cams for proper operation or settings. |
| 035* | ACAM Did Not Off During Upstroke | ACAM did not cycle during upstroke. | Press will stop or not run in single or continuous mode. | Check software cam logic or hardware cams for proper operation or settings. |

| Fault # | Fault Description | Cause of Fault | Effect of Fault | How to Correct the Fault |
|---|---|---|---|---|
| 036-039 | Spare | | | |
| 040* | C/B Air Pressure | Software detected no air pressure after energizing main valves. | Clutch valves are de-energized. | Check I/O wiring.<br>Check air pressure switch. |
| 041 | Spare | | | |
| 042* | Brake Monitor Cam Mismatch between Processors | One processor sees the BCAM while the other does not. | Press will stop or not run in single or continuous mode. | Check software cam logic or hardware cams for proper operation or settings. |
| 043* | Takeover Cam Mismatch between Processors | One processor sees the TCAM while the other does not. | Press will stop or not run in single or continuous mode. | Check software cam logic or hardware cams for proper operation or settings. |
| 044* | Anti-repeat Cam Mismatch between Processors | One processor sees the ACAM while the other does not. | Press will stop or not run in single or continuous mode. | Check software cam logic or hardware cams for proper operation or settings. |
| 045* | Soft Cam Fault Present | Any of 042-044 detected. | Press will stop or not run in single or continuous mode. | Check software cam logic or hardware cams for proper operation or settings. |
| 046 | Spare | | | |
| 047* | Brake Monitor | On a stop-on-top command, the press slid onto the BCAM before stopping. | Press cannot operate in single or continuous mode until it stops in the near top zone. | Check the brake and brake monitor cam settings. |
| 048 | Spare | | | |
| 049* | C/B Valve On and No Motion Detected | Upon command to move, no motion was detected. | The press will not start in single or continuous mode. | Check motion detector switch and wiring.<br>Check motion detector logic. |
| 050 | Spare | | | |
| 051* | Motion Detected with C/B Valves Off | Motion was detected when no motion was commanded. | C/B outputs are de-energized. | Check motion detector switch and wiring.<br>Check motion detector logic. |
| 052 | At Rest<br>Inch Button Tiedown | On switching to inch, the software detected a held inch button. | The press will not inch. | Check prompts for reasons why press will not inch. Check inch button wiring. |
| 053 | Spare | | | |
| 054 | At Rest<br>Run Button Tiedown | On switching to run, the software detected a held run button. | The press will not run in single or continuous mode. | Check prompts for reasons why press will not run. Check run button wiring. |
| 055* | Micro Inch Valve 1 Failed to Turn ON | Valve failed to energize when output was turned ON. | Press will not cycle. | Check valve and valve wiring. |
| 056* | Micro Inch Valve 1 Failed to Turn OFF | Valve failed to de-energize when output was turned OFF. | C/B power is removed. | Check valve and valve wiring. |
| 057* | Micro Inch Valve 2 Failed to Turn ON | Valve failed to energize when output was turned ON. | Press will not cycle. | Check valve and valve wiring. |
| 058* | Micro Inch Valve 2 Failed to Turn OFF | Valve failed to de-energize when output was turned OFF. | C/B power is removed. | Check valve and valve wiring. |
| 059-066 | Spare | | | |
| 067* | Clutch/Brake Dual Valve 1 Failed to Turn ON | Valve failed to energize when output was turned ON. | Press will not cycle. | Check valve and valve wiring. |
| 068* | Clutch/Brake Dual Valve 1 Failed to Turn OFF | Valve failed to de-energize when output was turned OFF. | C/B power is removed. | Check valve and valve wiring. |
| 069* | Clutch/Brake Dual Valve 2 Failed to Turn ON | Valve failed to energize when output was turned ON. | Press will not cycle. | Check valve and valve wiring. |
| 070* | Clutch/Brake Dual Valve 2 Failed to Turn OFF | Valve failed to de-energize when output was turned OFF. | C/B power is removed. | Check valve and valve wiring. |
| 071-074 | Spare | | | |
| 075 | Clutch Valve Fault | Any of 067-070 detected. | C/B power is removed. | Check valve and valve wiring. |
| 076-080 | Spare | | | |

* To clear this latched fault bit, you must enable the fault reset bit or turn the mode-select switch to OFF.

## Prompts for Operating the Press

Whenever the processor detects conditions worthy of a prompt, it sets corresponding Prompt #s or equivalent PanelView prompts. We list conditions for which the software is designed to detect and signal a prompt. Prompts #s (read from the data table) are independent of interface module used.

### Operator Prompts

| Prompt # | PanelView Prompt | Cause of the Prompt Condition | Effect of Prompt Condition | How to Correct the Condition |
|---|---|---|---|---|
| 001 | Spare | | | |
| 002 | E-Stop actuated | E-stop button was pressed, or E-stop circuit failed. | CRM and seal relays opened. | Release E-stop btn. Press control reset and C/B power reset btns. |
| 003 | Select mode | The press has stopped. You have not yet selected the operating mode. | You cannot reset C/B power. | Select either Inch, Single, or Continuous mode. |
| 004 | Release buttons | Static-state tiedown fault:, with either fault message 051 (inch) or 052 (run). | You cannot start the press. | Release run/inch buttons. Look for other fault or prompt messages. |
| 005 | Push buttons | Logic is ready to start, but you haven't pressed run/inch buttons. | Press is ready to start. | Press run/inch buttons. |
| 006-007 Spares | | | | |
| 008 | User Halted Downstroke Prompt | User Inch/Downstroke is not set | | Determined by user |
| 009 | Spare | | | |
| 010 | User Start Permissive Missing | User Permit Start/Inch/Run bit is not set | Press will not start in single or continuous mode | Determined by user |
| 011 | User Run Permissive Missing | User Permit Run (Immediate Stop) bit is not set. | | Determined by user |
| 012–013 Spares | | | | |
| 014 | Main motor is not running forward. | Main motor not running forward in single or continuous mode. | Valve outputs turn OFF. | Start the main motor (forward). |
| 015 | C/B power is not reset. | Seal relay is not closed. | Valve outputs remain OFF. | Clear faults. Reset control power. |
| 016–020 Spares | | | | |
| 021 | Stop-on-top button pressed. | The stop-on-top button is pressed. | The press will complete the cycle and stop at top. | None |
| 022 | Continuous mode not armed. | You did not press the arm continuous button. | You cannot start the press in continuous mode. | Press the arm continuous button. |
| 023–025 Spares | | | | |
| 026 | Other Processor Inch Mode Not Requested | Other Processor not requesting Inch Mode | You cannot Inch | Check remote I/O wiring |
| 027 | Other Processor Inch Mode Not Engaged | Other Processor not engaging Inch Mode | You cannot Inch | Check remote I/O wiring |
| 028 | Other Processor Single Not Engaged | Other Processor not engaging Single Mode | You cannot start single stroke | Check remote I/O wiring |
| 029 | Other Processor Not Arming Continuous | Other Processor not requesting Arm Continuous | You cannot start continuous stroke | Check remote I/O wiring |
| 030 | Other Processor Continuous Not Engaged | Other Processor not engaging Continuous Mode | You cannot start continuous stroke | Check remote I/O wiring |
| 031-079 Spares | | | | |
| 080 | Clutch/Brake Fault Present | | | |

## Notes:

# Wiring Drawings

## How We Present Wiring Drawings

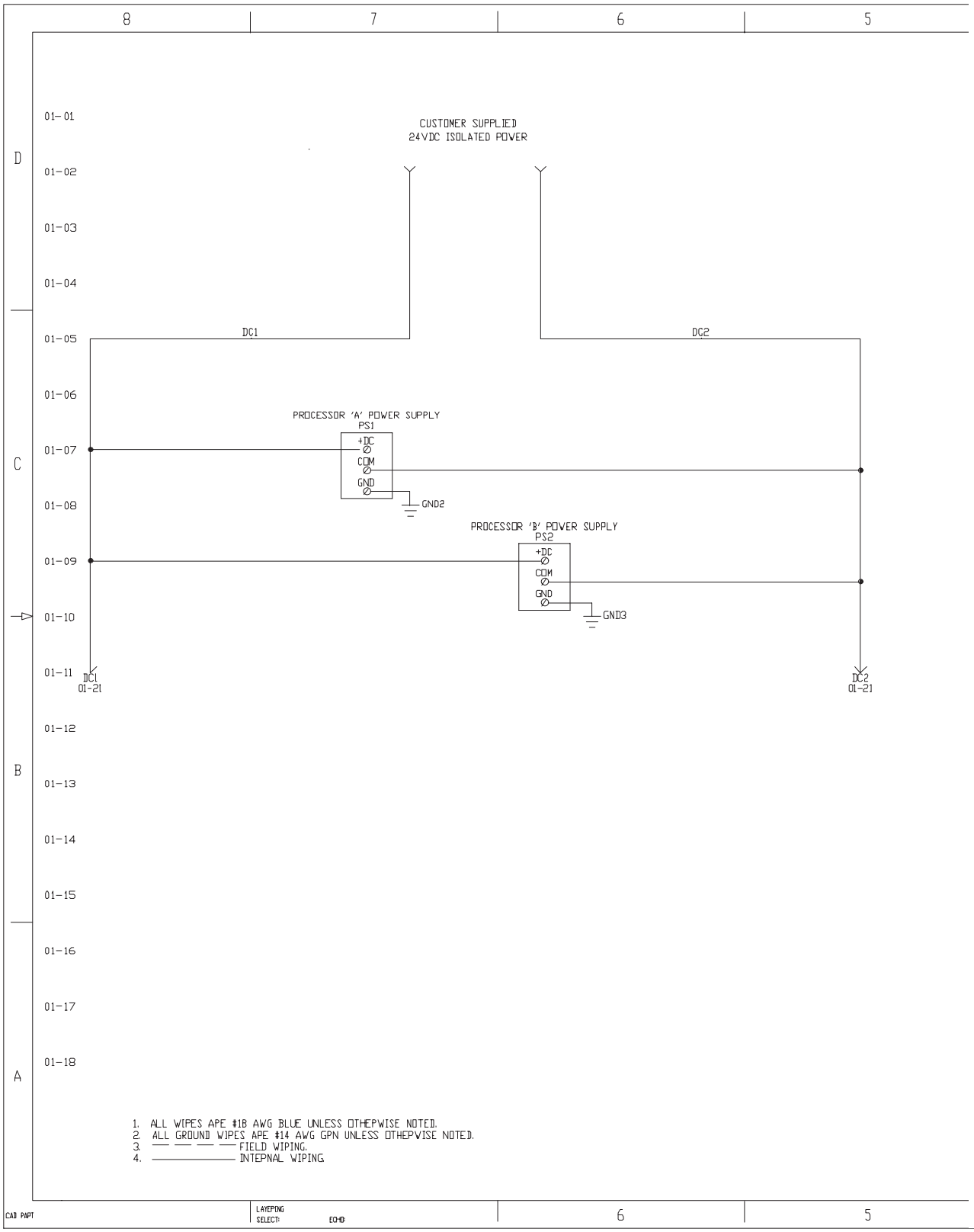
We show the following dc wiring drawings for your clutch/brake control.

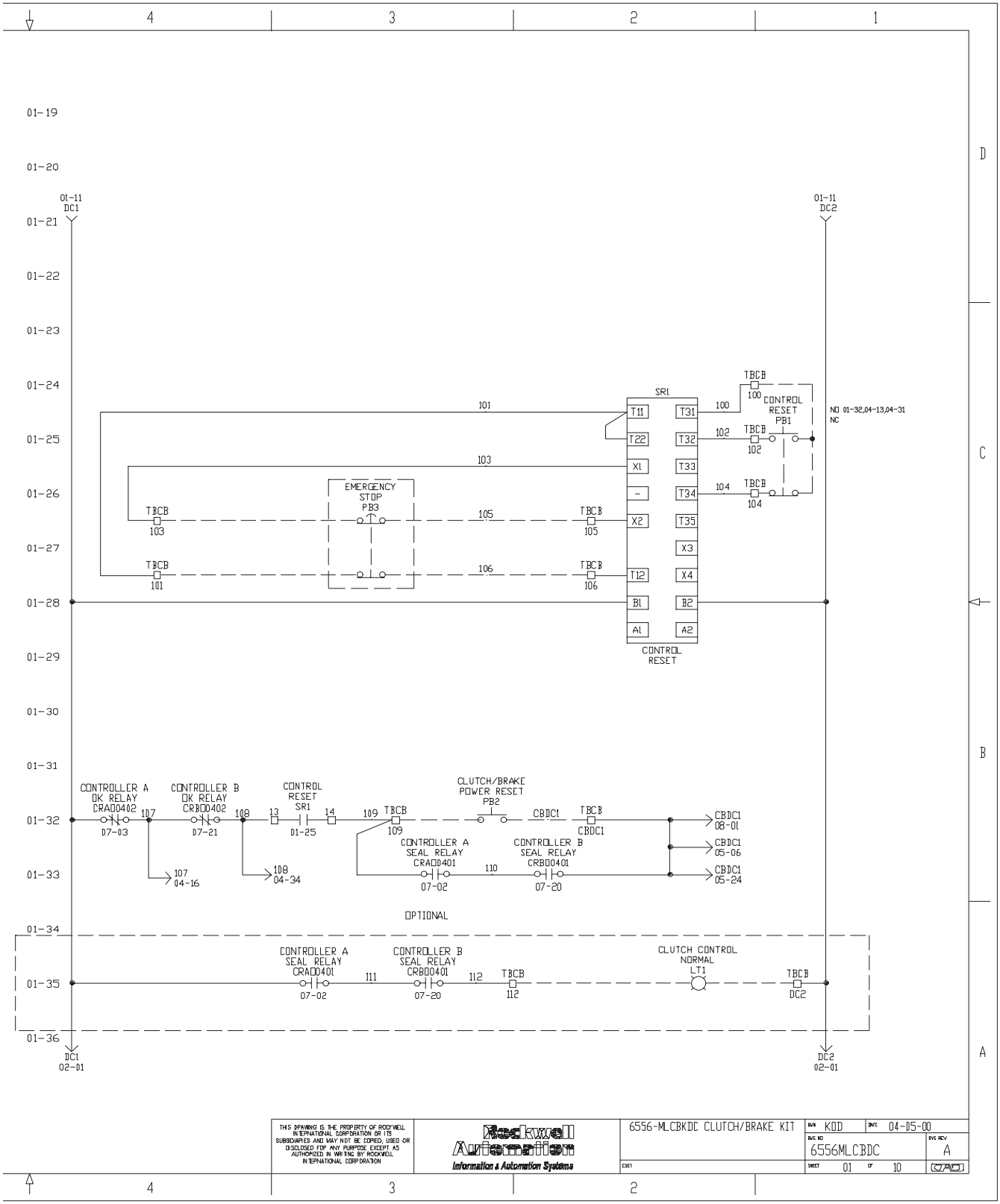
Inputs and outputs by I/O module and slot location are as follows:

| For | In I/O Module Location | See Drawing Sheet |
|---|---|---|
| Power Distribution | Base unit | 1 of 8 |
| Inputs to 1764–28BXB base unit of Controller cross–checked inputs (same as cross–checked outputs, next) | Base unit | 2 of 8 |
| Outputs to 1764–28BXB base unit Cross–checked Outputs<br>• OK To Energize Seal<br>• BCD Mode<br>• ACAM,BCAM,TCAM<br>• Clutch Output ON<br>• Heartbeat | Base Unit | 3 of 8 |
| Inputs to 1769–IQ16 (dc) or 1769–IA16 (ac)<br>• Mode Select<br>• Emergency Stop Master Relay<br>• Controller OK relays<br>• Seal Relay<br>• Clutch/Brake 1 Feedback<br>• Clutch/Brake 2 Feedback<br>• Controller B MicroInch 1 and 2 Output Feedbacks<br>• ACAM,BCAM,TCAM | Slot 1 | 4 of 8 |
| Inputs to 1769–IQ16 (dc) or 1769–IA16 (ac)<br>• Clutch/Brake Power Feedback<br>• Clutch/Brake Air Pressure<br>• Perimeter Guard A<br>• Motion Detect<br>• Main Motor Forward<br>• Cycle Stop<br>• Arm Continuous setup<br>• Fault Reset<br>• User Permits<br>• Left and Right Run Stations<br>• Left and Right Inch Pushbuttons | Slot 2 | 5 of 8 |

| For | In I/O Module Location | See Drawing Sheet |
|---|---|---|
| 1769–OW8I (dc or ac) Outputs<br>• Perimeter Guard A Input<br>• Controller Seal Relay<br>• Controller OK Relay<br>• Continuous Armed<br>• Clutch Control Fault | Slot 3 | 6 of 8 |
| 1769–OW8I (dc or ac) Outputs<br>• Controller A Clutch/Brake 1 and 2 Output Feedbacks<br>• Controller B Clutch/Brake 1 and 2 Output Feedbacks<br>• Controller A MicroInch 1 and 2 Output Feedbacks<br>• Controller B MicroInch 1 and 2 Output Feedbacks | Slot 4 | 7 of 8 |

Wire power supplies according to instructions that accompanied them.


8
7
6
5
D
C
B
A
01-01
01-02
01-03
01-04
01-05
01-06
01-07
01-08
01-09
01-10
01-11
01-12
01-13
01-14
01-15
01-16
01-17
01-18
CUSTOMER SUPPLIED
24VDC ISOLATED POWER
DC1
DC2
PROCESSOR 'A' POWER SUPPLY
PS1
+DC
COM
GND
GND2
PROCESSOR 'B' POWER SUPPLY
PS2
+DC
COM
GND
GND3
DC1
01-21
DC2
01-21
1. ALL WIPES ARE #18 AWG BLUE UNLESS OTHERWISE NOTED.
2. ALL GROUND WIRES ARE #14 AWG GRN UNLESS OTHERWISE NOTED.
3. — — — — FIELD WIRING.
4. ———— INTERNAL WIRING.
CAD PART
LAYERING
SELECT:
ECHO
6
5


4
3
2
1
D
C
B
A
01-19
01-20
01-21
01-22
01-23
01-24
01-25
01-26
01-27
01-28
01-29
01-30
01-31
01-32
01-33
01-34
01-35
01-36
01-11 DC1
01-11 DC2
SR1
T11
T22
X1
-
X2
T12
B1
A1
T31
T32
T33
T34
T35
X3
X4
B2
A2
CONTROL RESET
101
103
105
106
100
102
104
TBCB 100
TBCB 102
TBCB 104
CONTROL RESET PB1
NO 01-32,04-13,04-31
NC
EMERGENCY STOP PB3
TBCB 103
TBCB 105
TBCB 101
TBCB 106
CONTROLLER A OK RELAY CRA00402
CONTROLLER B OK RELAY CRB00402
CONTROL RESET SR1
CLUTCH/BRAKE POWER RESET PB2
CBDC1
TBCB 109
CBDC1 08-01
CBDC1 05-06
CBDC1 05-24
CONTROLLER A SEAL RELAY CRA00401
CONTROLLER B SEAL RELAY CRB00401
07-02
07-20
07-03
07-21
01-25
107 04-16
108 04-34
OPTIONAL
CLUTCH CONTROL NORMAL LT1
TBCB 112
TBCB DC2
DC1 02-01
DC2 02-01
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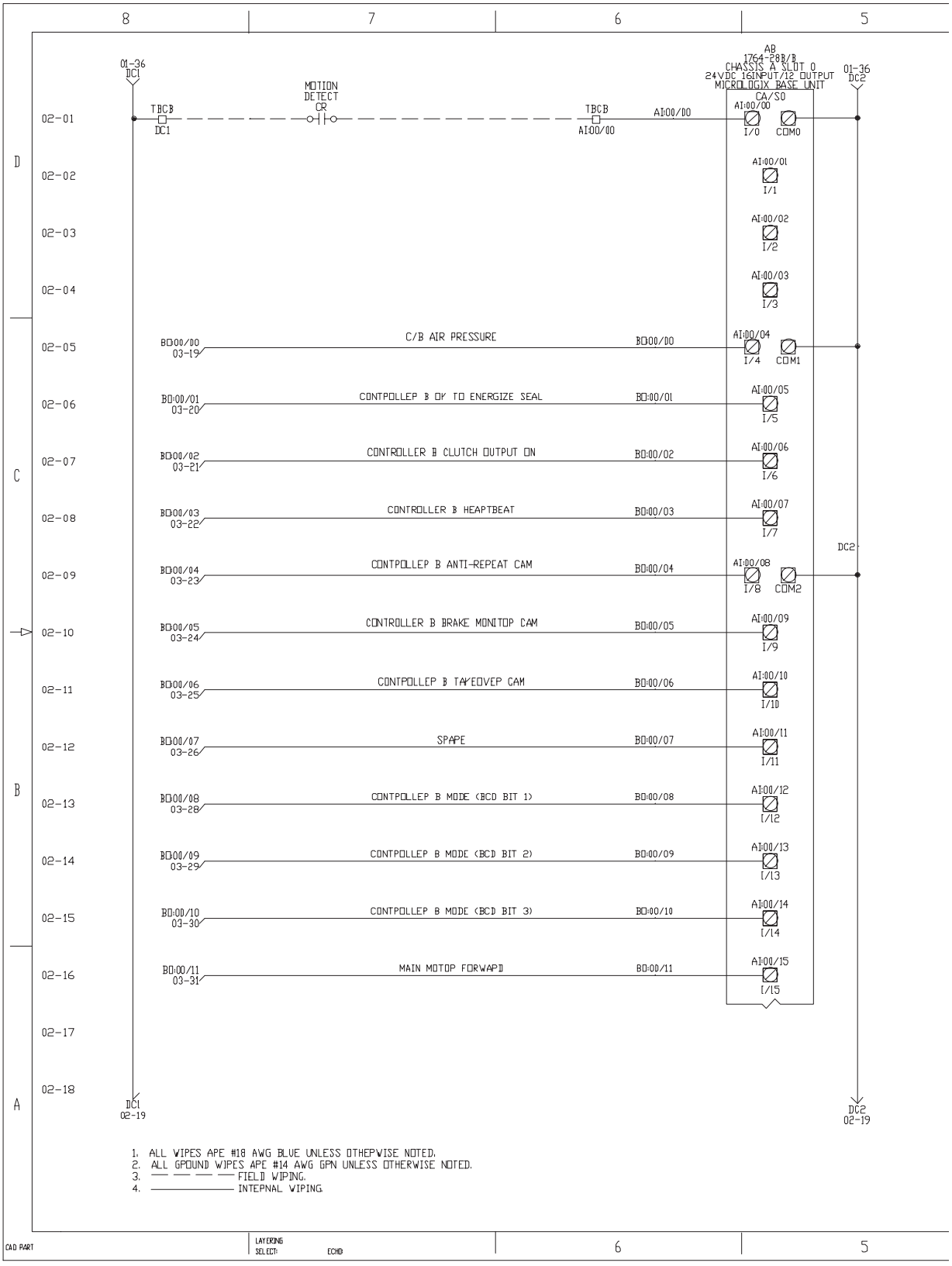
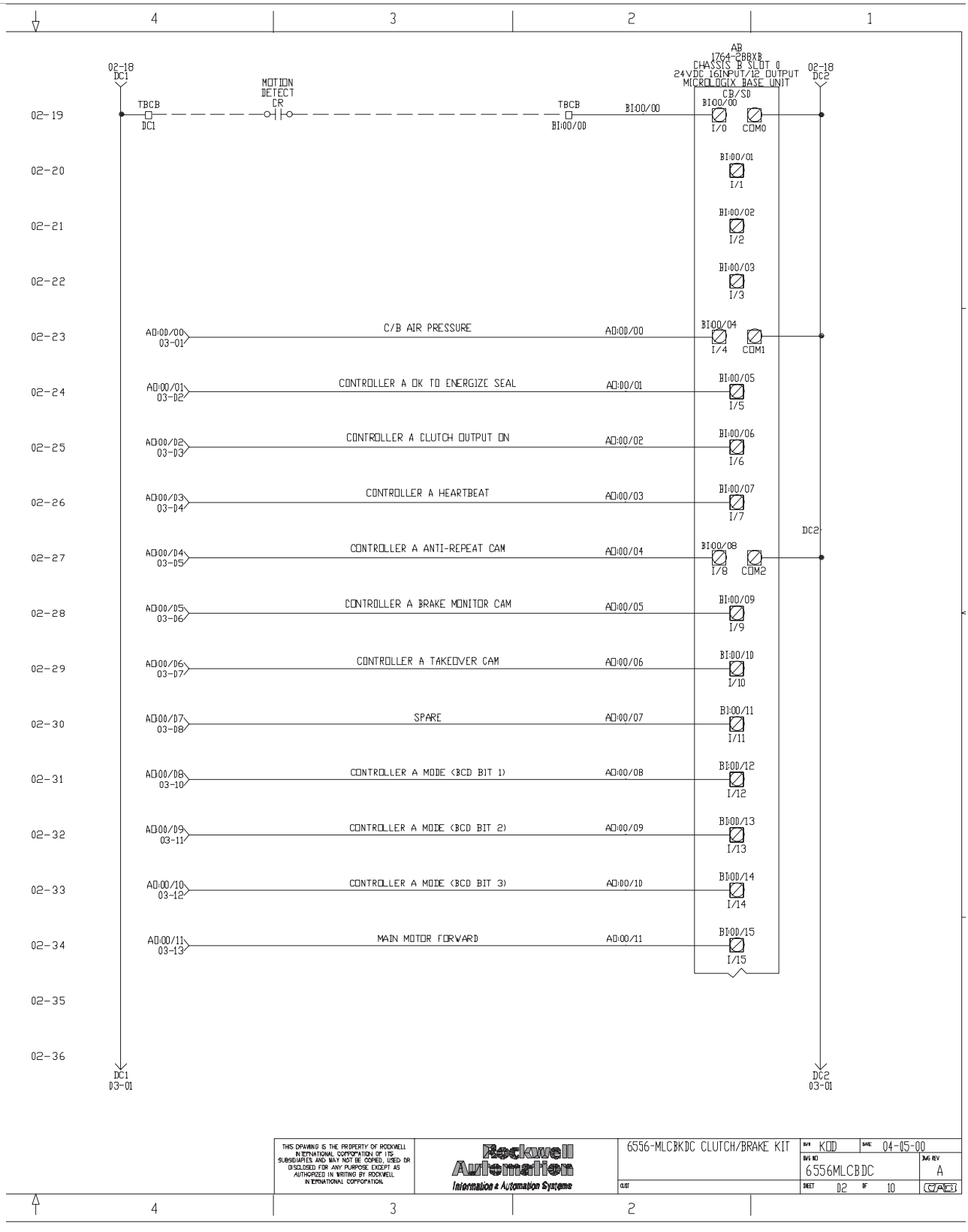
6556-MLCBKDC CLUTCH/BRAKE KIT
DWN KDD
DATE 04-05-00
DWG NO 6556MLCBDC
DWG REV A
SHEET 01 OF 10


8
7
6
5
D
C
B
A
01-36
DC1
MOTION
DETECT
CR
TBCB
DC1
TBCB
AI:00/00
AI:00/00
AB
1764-28B/B
CHASSIS A SLOT 0
24VDC 16INPUT/12 OUTPUT
MICROLOGIX BASE UNIT
CA/SO
01-36
DC2
AI:00/00
I/0
COM0
AI:00/01
I/1
AI:00/02
I/2
AI:00/03
I/3
AI:00/04
I/4
COM1
AI:00/05
I/5
AI:00/06
I/6
AI:00/07
I/7
AI:00/08
I/8
COM2
AI:00/09
I/9
AI:00/10
I/10
AI:00/11
I/11
AI:00/12
I/12
AI:00/13
I/13
AI:00/14
I/14
AI:00/15
I/15
02-01
02-02
02-03
02-04
02-05
02-06
02-07
02-08
02-09
02-10
02-11
02-12
02-13
02-14
02-15
02-16
02-17
02-18
BO:00/00
03-19
C/B AIR PRESSURE
BO:00/00
BO:00/01
03-20
CONTPOLLEP B OK TO ENERGIZE SEAL
BO:00/01
BO:00/02
03-21
CONTROLLER B CLUTCH OUTPUT ON
BO:00/02
BO:00/03
03-22
CONTROLLER B HEAPTBEAT
BO:00/03
BO:00/04
03-23
CONTPOLLEP B ANTI-REPEAT CAM
BO:00/04
BO:00/05
03-24
CONTROLLER B BRAKE MONITOP CAM
BO:00/05
BO:00/06
03-25
CONTPOLLEP B TAKEOVEP CAM
BO:00/06
BO:00/07
03-26
SPAPE
BO:00/07
BO:00/08
03-28
CONTPOLLEP B MODE (BCD BIT 1)
BO:00/08
BO:00/09
03-29
CONTPOLLEP B MODE (BCD BIT 2)
BO:00/09
BO:00/10
03-30
CONTPOLLEP B MODE (BCD BIT 3)
BO:00/10
BO:00/11
03-31
MAIN MOTOP FORWAPD
BO:00/11
DC2
DC1
02-19
DC2
02-19
1. ALL WIPES APE #18 AWG BLUE UNLESS OTHEPWISE NOTED.
2. ALL GPOUND WIPES APE #14 AWG GPN UNLESS OTHERWISE NOTED.
3. — — — — FIELD WIPING.
4. ——————— INTEPNAL WIPING.
CAD PART
LAYERING
SELECT:
ECHO
6
5


4
3
2
1
AB
1764-CBRXB
CHASSIS B SLOT 0
24VDC 16INPUT/12 OUTPUT
MICROLOGIX BASE UNIT
CB/SD
02-18
DC1
MOTION
DETECT
CR
TBCB
DC1
TBCB
BI:00/00
02-18
DC2
02-19
BI:00/00
I/0
COM0
02-20
BI:00/01
I/1
02-21
BI:00/02
I/2
02-22
BI:00/03
I/3
02-23
AO:00/00
03-01
C/B AIR PRESSURE
AO:00/00
BI:00/04
I/4
COM1
02-24
AO:00/01
03-02
CONTROLLER A OK TO ENERGIZE SEAL
AO:00/01
BI:00/05
I/5
02-25
AO:00/02
03-03
CONTROLLER A CLUTCH OUTPUT ON
AO:00/02
BI:00/06
I/6
02-26
AO:00/03
03-04
CONTROLLER A HEARTBEAT
AO:00/03
BI:00/07
I/7
DC2
02-27
AO:00/04
03-05
CONTROLLER A ANTI-REPEAT CAM
AO:00/04
BI:00/08
I/8
COM2
02-28
AO:00/05
03-06
CONTROLLER A BRAKE MONITOR CAM
AO:00/05
BI:00/09
I/9
02-29
AO:00/06
03-07
CONTROLLER A TAKEOVER CAM
AO:00/06
BI:00/10
I/10
02-30
AO:00/07
03-08
SPARE
AO:00/07
BI:00/11
I/11
02-31
AO:00/08
03-10
CONTROLLER A MODE (BCD BIT 1)
AO:00/08
BI:00/12
I/12
02-32
AO:00/09
03-11
CONTROLLER A MODE (BCD BIT 2)
AO:00/09
BI:00/13
I/13
02-33
AO:00/10
03-12
CONTROLLER A MODE (BCD BIT 3)
AO:00/10
BI:00/14
I/14
02-34
AO:00/11
03-13
MAIN MOTOR FORWARD
AO:00/11
BI:00/15
I/15
02-35
02-36
DC1
03-01
DC2
03-01
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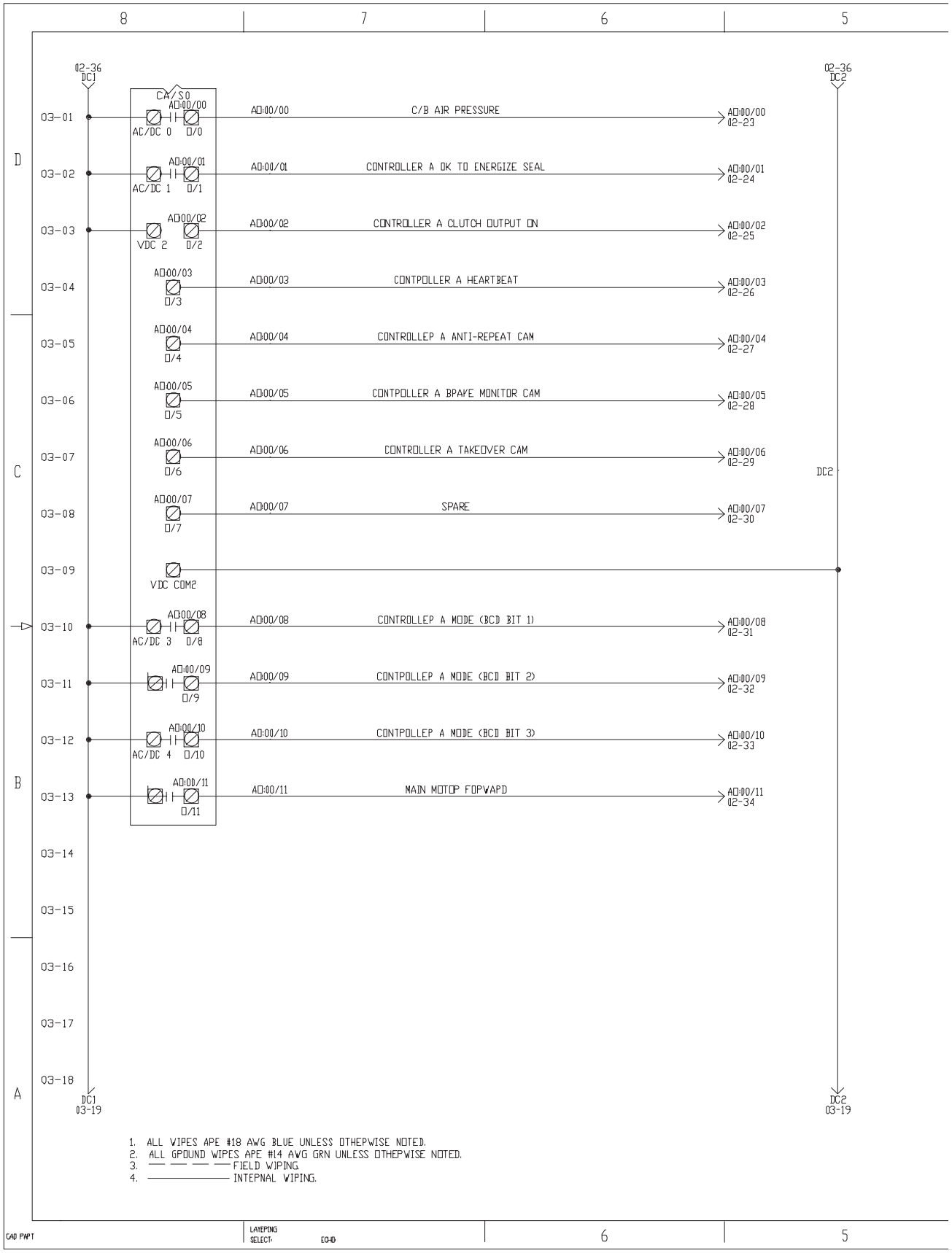
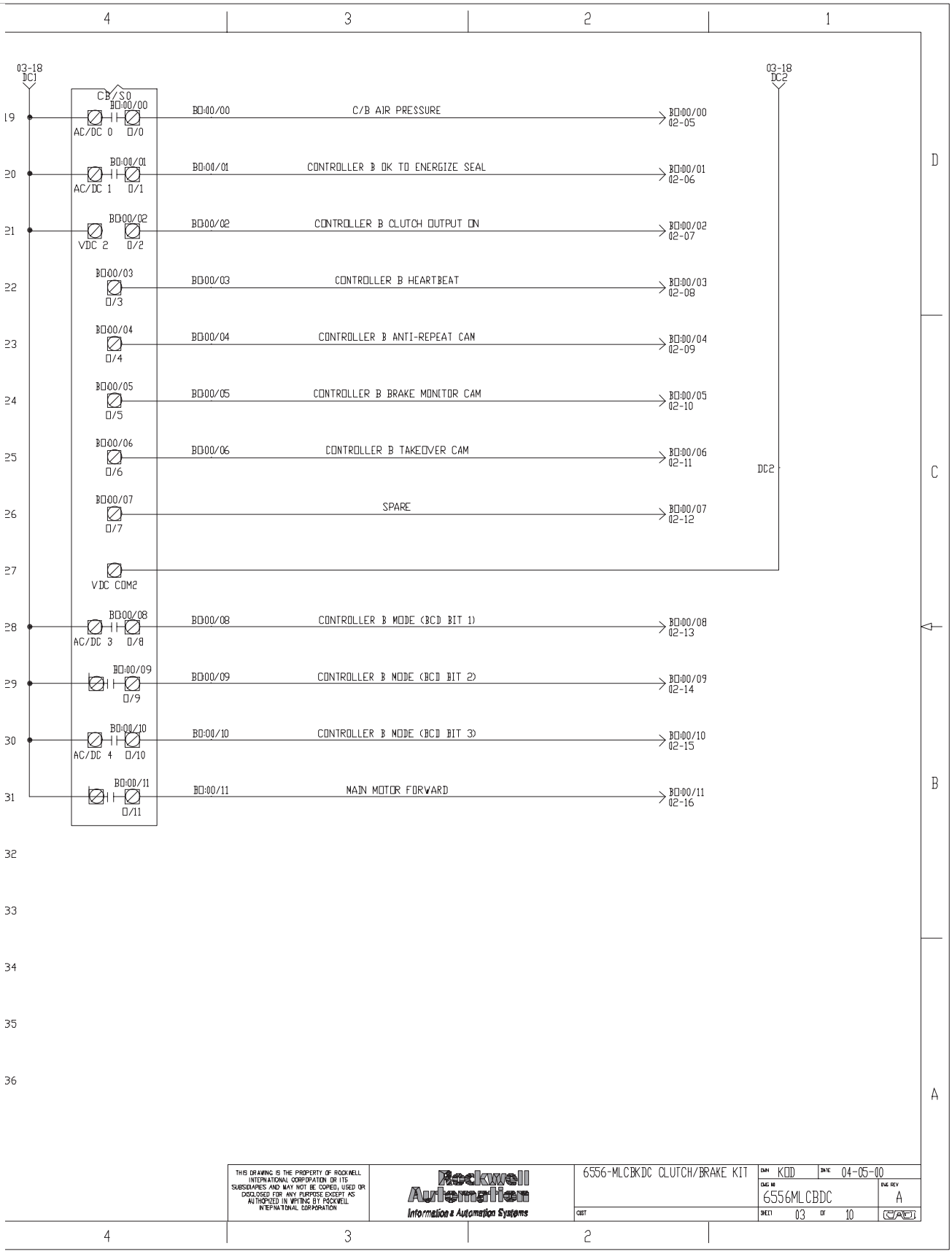
6556-MLCBKDC CLUTCH/BRAKE KIT
DWN KDD
DATE 04-05-00
DWG NO 6556MLCBDC
DWG REV A
CUST
SHEET 02 OF 10
SIZE D


8
7
6
5
02-36
DC1
02-36
DC2
CARD
AD:00/00
03-01
AC/DC 0 □/0
AD:00/00
C/B AIR PRESSURE
AD:00/00
02-23
AD:00/01
03-02
AC/DC 1 □/1
AD:00/01
CONTROLLER A OK TO ENERGIZE SEAL
AD:00/01
02-24
AD:00/02
03-03
VDC 2 □/2
AD:00/02
CONTROLLER A CLUTCH OUTPUT ON
AD:00/02
02-25
AD:00/03
03-04
□/3
AD:00/03
CONTPOLLER A HEARTBEAT
AD:00/03
02-26
AD:00/04
03-05
□/4
AD:00/04
CONTROLLEP A ANTI-REPEAT CAM
AD:00/04
02-27
AD:00/05
03-06
□/5
AD:00/05
CONTPOLLER A BPAKE MONITOR CAM
AD:00/05
02-28
AD:00/06
03-07
□/6
AD:00/06
CONTROLLER A TAKEOVER CAM
AD:00/06
02-29
AD:00/07
03-08
□/7
AD:00/07
SPARE
AD:00/07
02-30
03-09
VDC COM2
AD:00/08
03-10
AC/DC 3 □/8
AD:00/08
CONTROLLEP A MODE (BCD BIT 1)
AD:00/08
02-31
AD:00/09
03-11
□/9
AD:00/09
CONTPOLLEP A MODE (BCD BIT 2)
AD:00/09
02-32
AD:00/10
03-12
AC/DC 4 □/10
AD:00/10
CONTPOLLEP A MODE (BCD BIT 3)
AD:00/10
02-33
AD:00/11
03-13
□/11
AD:00/11
MAIN MOTOP FOPWAPD
AD:00/11
02-34
03-14
03-15
03-16
03-17
03-18
DC2
DC1
03-19
DC2
03-19
D
C
B
A
1. ALL WIPES APE #18 AWG BLUE UNLESS OTHEPWISE NOTED.
2. ALL GPOUND WIPES APE #14 AWG GRN UNLESS OTHEPWISE NOTED.
3. — — — — FIELD WIPING.
4. ———— INTEPNAL WIPING.
CAD PART
LAYEPING
SELECT:
ECHO
6
5


4
3
2
1
03-18
DC1
03-18
DC2
C/S 0
B0:00/00
AC/DC 0 0/0
B0:00/00
C/B AIR PRESSURE
B0:00/00
02-05
B0:00/01
AC/DC 1 0/1
B0:00/01
CONTROLLER B OK TO ENERGIZE SEAL
B0:00/01
02-06
B0:00/02
VDC 2 0/2
B0:00/02
CONTROLLER B CLUTCH OUTPUT ON
B0:00/02
02-07
B0:00/03
0/3
B0:00/03
CONTROLLER B HEARTBEAT
B0:00/03
02-08
B0:00/04
0/4
B0:00/04
CONTROLLER B ANTI-REPEAT CAM
B0:00/04
02-09
B0:00/05
0/5
B0:00/05
CONTROLLER B BRAKE MONITOR CAM
B0:00/05
02-10
B0:00/06
0/6
B0:00/06
CONTROLLER B TAKEOVER CAM
B0:00/06
02-11
DC2
B0:00/07
0/7
SPARE
B0:00/07
02-12
VDC COM2
B0:00/08
AC/DC 3 0/8
B0:00/08
CONTROLLER B MODE (BCD BIT 1)
B0:00/08
02-13
B0:00/09
0/9
B0:00/09
CONTROLLER B MODE (BCD BIT 2)
B0:00/09
02-14
B0:00/10
AC/DC 4 0/10
B0:00/10
CONTROLLER B MODE (BCD BIT 3)
B0:00/10
02-15
B0:00/11
0/11
B0:00/11
MAIN MOTOR FORWARD
B0:00/11
02-16
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
D
C
B
A
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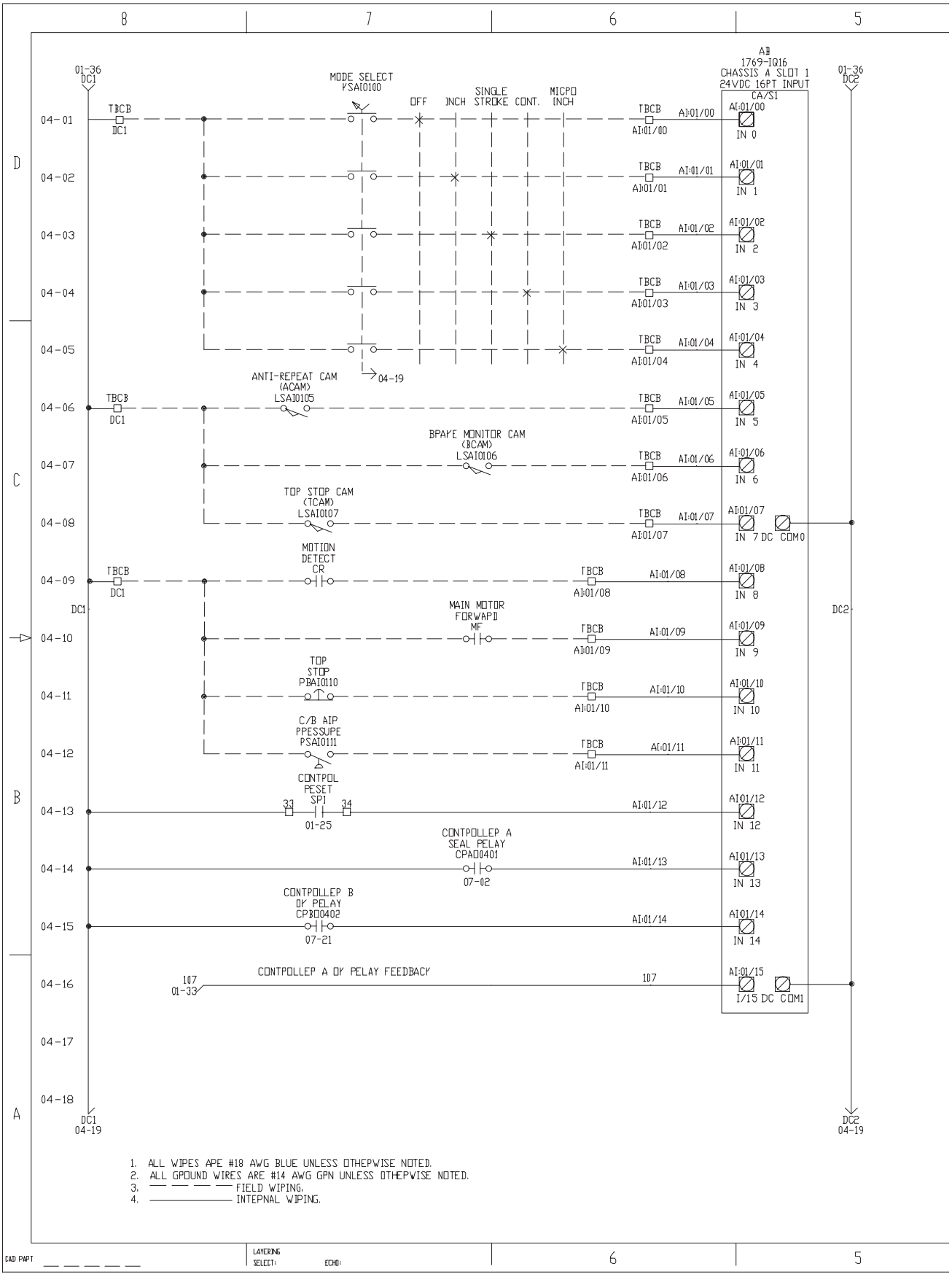
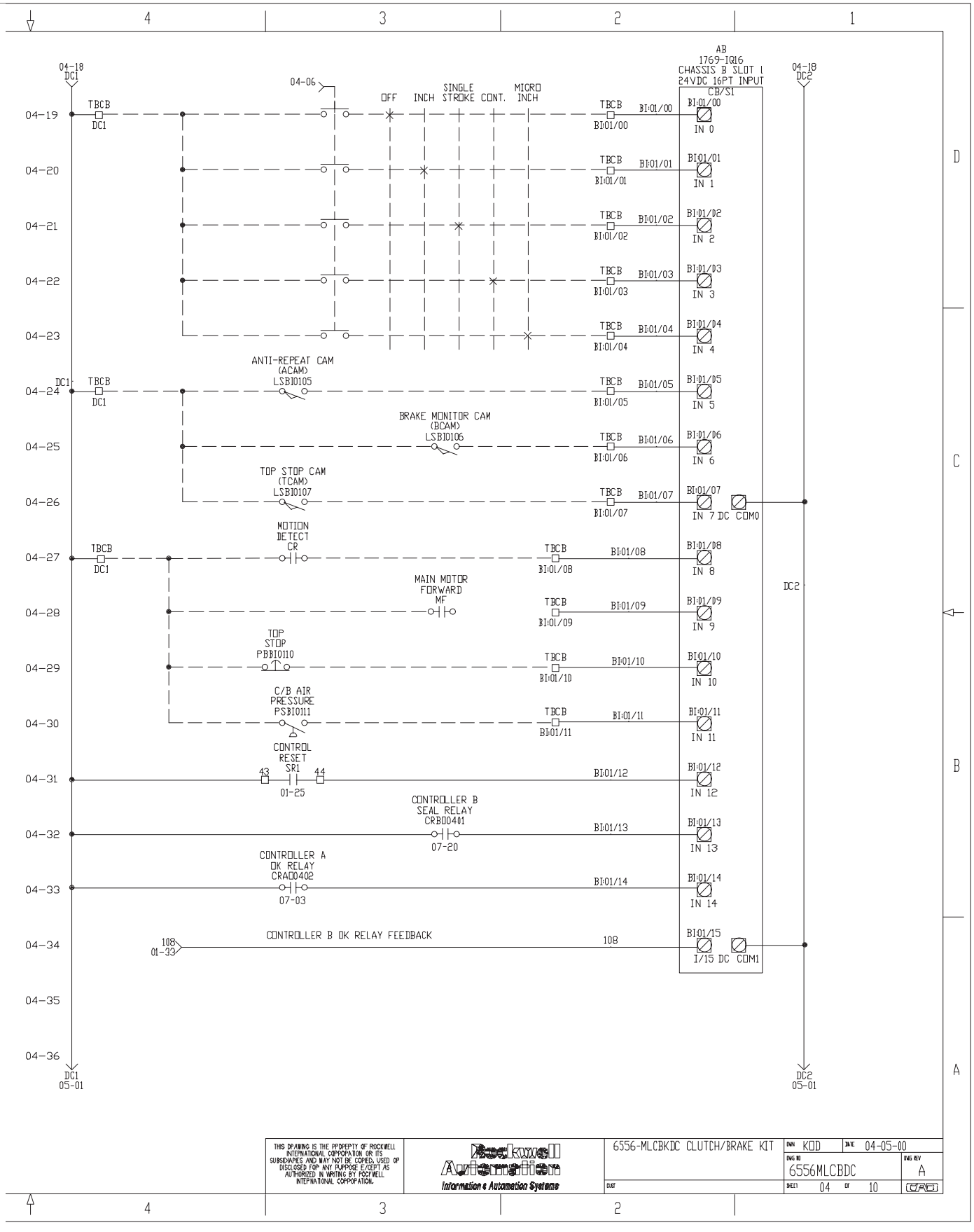
DWN KDD
DATE 04-05-00
DWG NO 6556MLCBDC
DWG REV A
CUST
SHEET 03 OF 10
CAD


8
7
6
5
D
C
B
A
01-36
DC1
MODE SELECT
LSAI0100
OFF
INCH
SINGLE STROKE CONT.
MICRO INCH
TBCB
DC1
04-01
04-02
04-03
04-04
04-05
04-19
ANTI-REPEAT CAM
(ACAM)
LSAI0105
04-06
BRAKE MONITOR CAM
(BCAM)
LSAI0106
04-07
TOP STOP CAM
(TCAM)
LSAI0107
04-08
MOTION
DETECT
CR
04-09
MAIN MOTOR
FORWARD
MF
04-10
TOP
STOP
PBAI0110
04-11
C/B AIR
PRESSURE
PSAI0111
04-12
CONTROL
RESET
SR1
33
34
01-25
04-13
CONTROLLER A
SEAL RELAY
CRA00401
07-02
04-14
CONTROLLER B
DRY RELAY
CRB00402
07-21
04-15
CONTROLLER A DRY RELAY FEEDBACK
107
01-33
04-16
04-17
04-18
DC1
04-19
AB
1769-IQ16
CHASSIS A SLOT 1
24VDC 16PT INPUT
CAT51
AI:01/00
AI:01/01
AI:01/02
AI:01/03
AI:01/04
AI:01/05
AI:01/06
AI:01/07
AI:01/08
AI:01/09
AI:01/10
AI:01/11
AI:01/12
AI:01/13
AI:01/14
AI:01/15
IN 0
IN 1
IN 2
IN 3
IN 4
IN 5
IN 6
IN 7 DC COM0
IN 8
IN 9
IN 10
IN 11
IN 12
IN 13
IN 14
I/15 DC COM1
DC2
01-36
DC2
04-19
1. ALL WIRES ARE #18 AWG BLUE UNLESS OTHERWISE NOTED.
2. ALL GROUND WIRES ARE #14 AWG GRN UNLESS OTHERWISE NOTED.
3. — — — — — FIELD WIRING.
4. ———— INTERNAL WIRING.
CAD PART
LAYERING
SELECT:
ECHO:


AB
1769-IQ16
CHASSIS B SLOT 1
24VDC 16PT INPUT
CB/S1
04-18
DC1
04-18
DC2
04-06
OFF
SINGLE
INCH
STROKE
CONT.
MICRO
INCH
TBCB
DC1
BI:01/00
IN 0
BI:01/01
IN 1
BI:01/02
IN 2
BI:01/03
IN 3
BI:01/04
IN 4
ANTI-REPEAT CAM
(ACAM)
LSBI0105
BI:01/05
IN 5
BRAKE MONITOR CAM
(BCAM)
LSBI0106
BI:01/06
IN 6
TOP STOP CAM
(TCAM)
LSBI0107
BI:01/07
IN 7 DC COM0
MOTION
DETECT
CR
BI:01/08
IN 8
MAIN MOTOR
FORWARD
MF
BI:01/09
IN 9
TOP
STOP
PBBI0110
BI:01/10
IN 10
C/B AIR
PRESSURE
PSBI0111
BI:01/11
IN 11
CONTROL
RESET
SR1
43
44
01-25
BI:01/12
IN 12
CONTROLLER B
SEAL RELAY
CRBI0401
07-20
BI:01/13
IN 13
CONTROLLER A
OK RELAY
CRAI0402
07-03
BI:01/14
IN 14
CONTROLLER B OK RELAY FEEDBACK
108
01-33
BI:01/15
I/15 DC COM1
04-19
04-20
04-21
04-22
04-23
04-24
04-25
04-26
04-27
04-28
04-29
04-30
04-31
04-32
04-33
04-34
04-35
04-36
DC1
05-01
DC2
05-01
D
C
B
A
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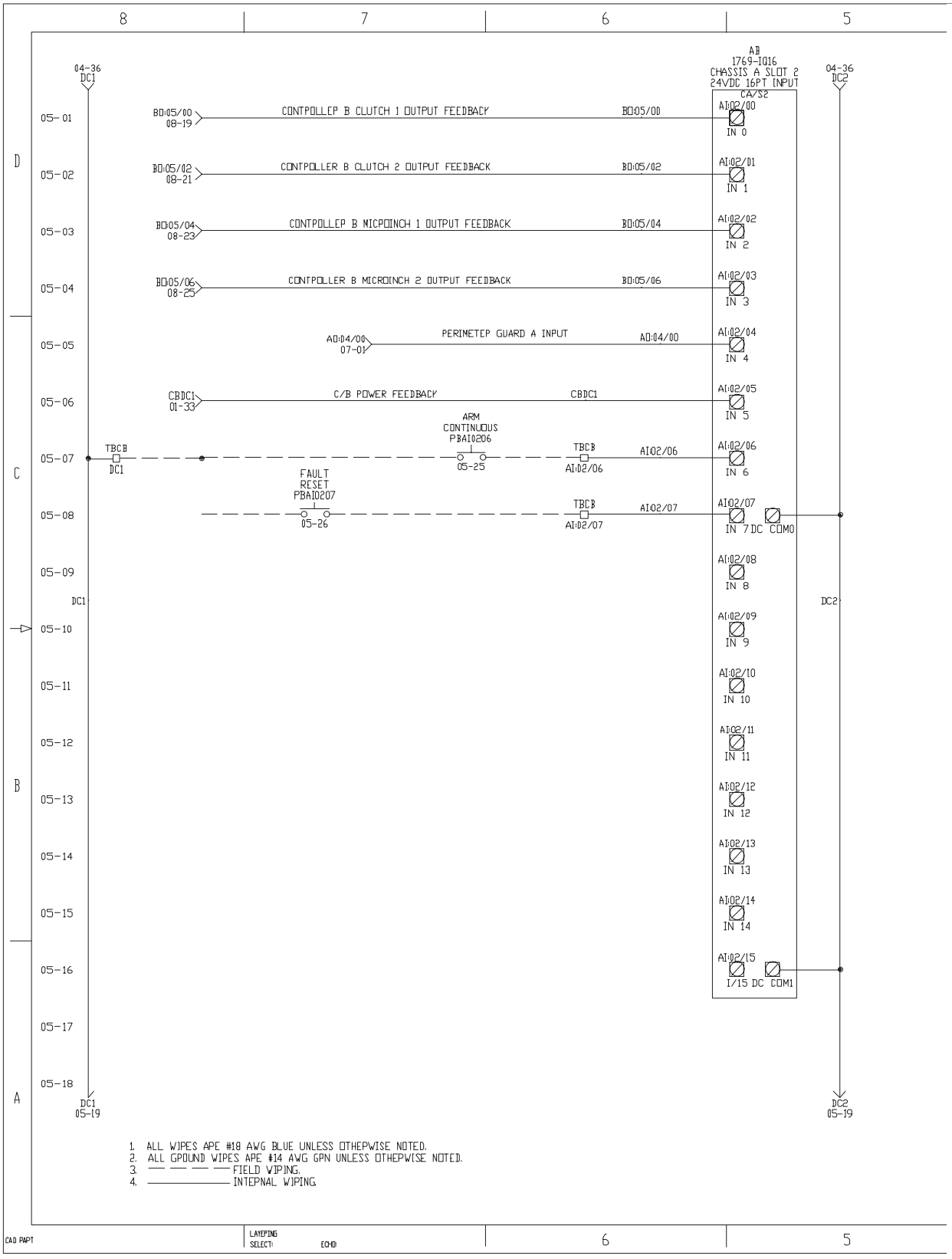
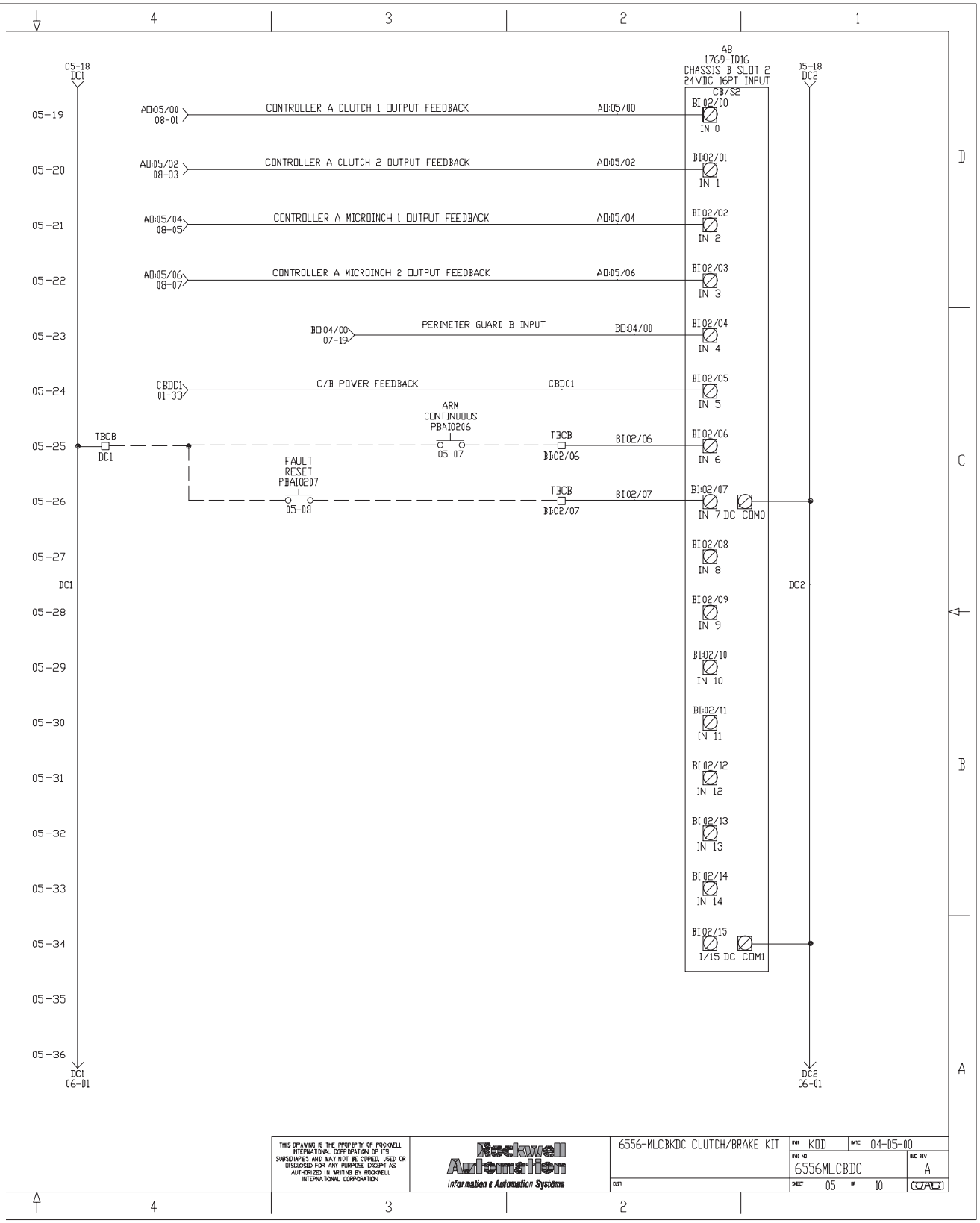
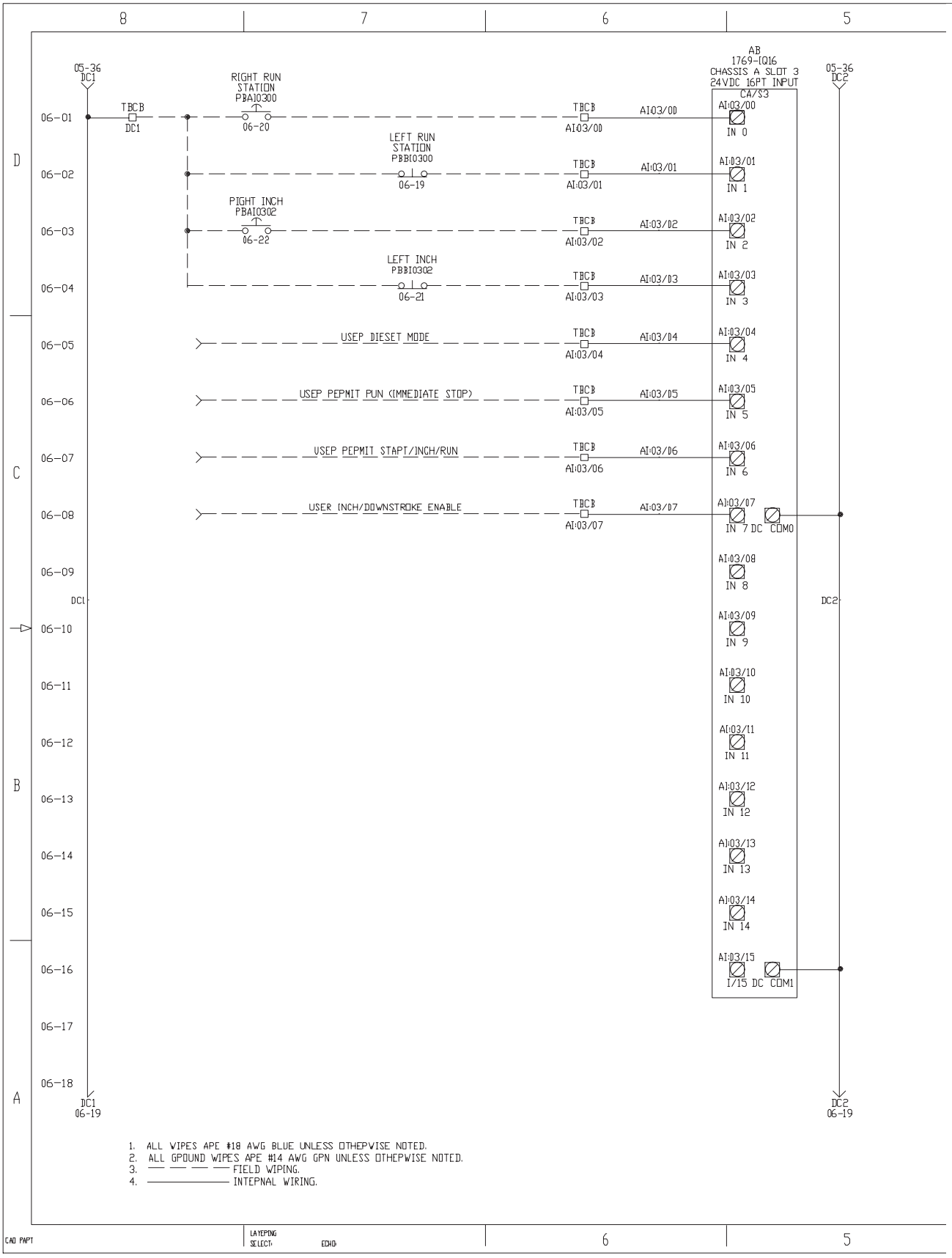
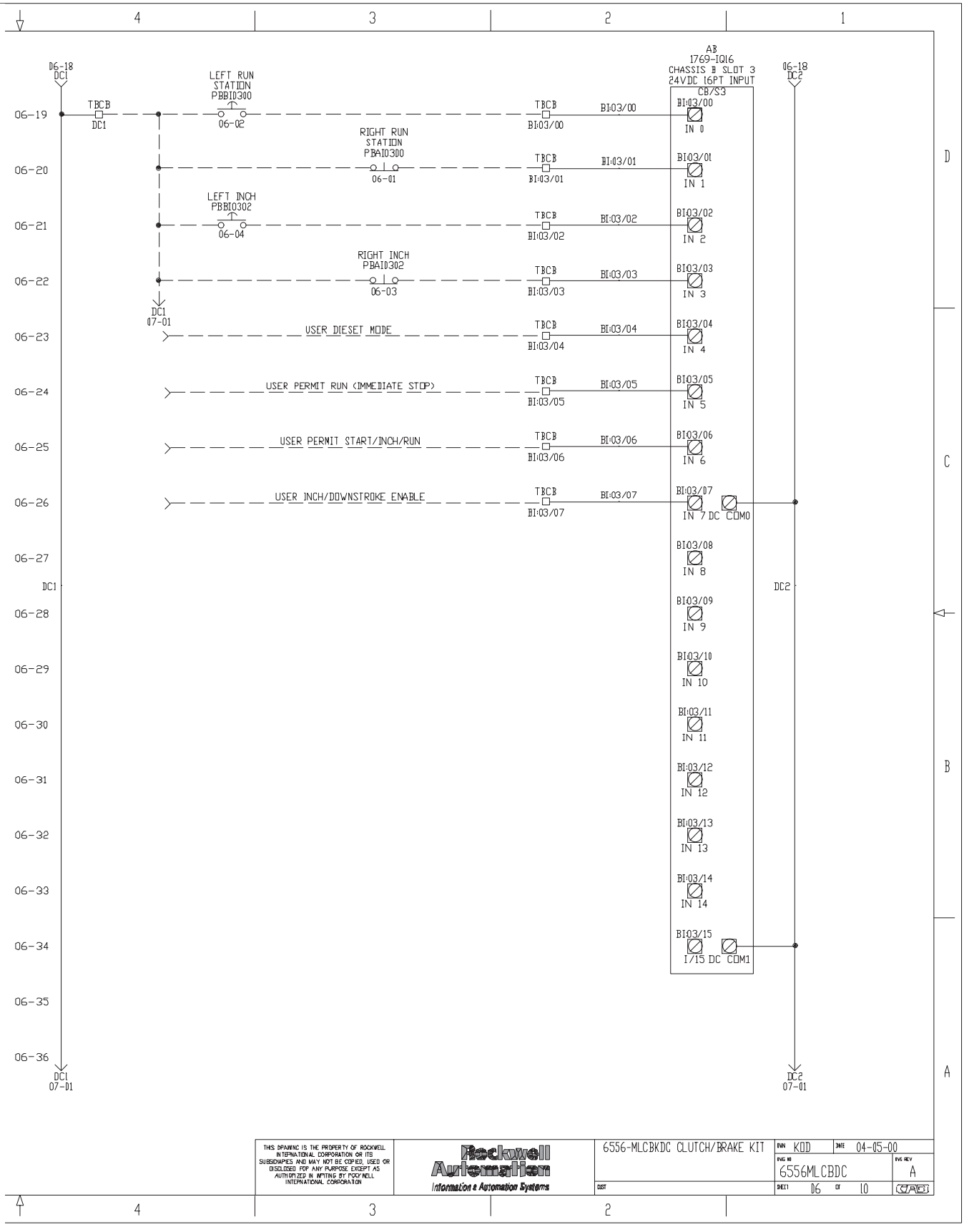
6556-MLCBKDC CLUTCH/BRAKE KIT
DWN KDD
DATE 04-05-00
DWG NO 6556MLCBDC
DWG REV A
SHEET 04 OF 10
CAD


8
7
6
5
04-36
DC1
AH
1769-IQ16
CHASSIS A SLOT 2
24VDC 16PT INPUT
CA/S2
04-36
DC2
05-01
BD:05/00
08-19
CONTPOLLEP B CLUTCH 1 OUTPUT FEEDBACP
BD:05/00
AI:02/00
IN 0
05-02
BD:05/02
08-21
CONTPOLLER B CLUTCH 2 OUTPUT FEEDBACK
BD:05/02
AI:02/01
IN 1
05-03
BD:05/04
08-23
CONTPOLLEP B MICPOINCH 1 OUTPUT FEEDBACK
BD:05/04
AI:02/02
IN 2
05-04
BD:05/06
08-25
CONTPOLLER B MICROINCH 2 OUTPUT FEEDBACK
BD:05/06
AI:02/03
IN 3
05-05
AO:04/00
07-01
PERIMETEP GUARD A INPUT
AO:04/00
AI:02/04
IN 4
05-06
CBDC1
01-33
C/B POWER FEEDBACP
CBDC1
AI:02/05
IN 5
ARM
CONTINUOUS
PBAI0206
05-25
TBCB
AI:02/06
AI:02/06
IN 6
TBCB
DC1
05-07
FAULT
RESET
PBAI0207
05-26
TBCB
AI:02/07
AI:02/07
IN 7 DC COMO
05-08
AI:02/08
IN 8
05-09
DC1
DC2
05-10
AI:02/09
IN 9
05-11
AI:02/10
IN 10
05-12
AI:02/11
IN 11
05-13
AI:02/12
IN 12
05-14
AI:02/13
IN 13
05-15
AI:02/14
IN 14
05-16
AI:02/15
I/15 DC COM1
05-17
05-18
DC1
05-19
DC2
05-19
D
C
B
A
1. ALL WIPES APE #18 AWG BLUE UNLESS OTHEPWISE NOTED.
2. ALL GPOUND WIPES APE #14 AWG GPN UNLESS OTHEPWISE NOTED.
3. — — — — FIELD WIPING.
4. ———— INTEPNAL WIPING.
CAD PAPT
LAYEPING
SELECT:
ECHD
6
5


AB
1769-IQ16
CHASSIS B SLOT 2
24VDC 16PT INPUT
C:B/S2
05-18
DC1
05-18
DC2
CONTROLLER A CLUTCH 1 OUTPUT FEEDBACK
CONTROLLER A CLUTCH 2 OUTPUT FEEDBACK
CONTROLLER A MICROINCH 1 OUTPUT FEEDBACK
CONTROLLER A MICROINCH 2 OUTPUT FEEDBACK
PERIMETER GUARD B INPUT
C/B POWER FEEDBACK
ARM
CONTINUOUS
PBAI0206
FAULT
RESET
PBAI0207
TBCB
DC1
05-07
05-08
IN 0
IN 1
IN 2
IN 3
IN 4
IN 5
IN 6
IN 7 DC COM0
IN 8
IN 9
IN 10
IN 11
IN 12
IN 13
IN 14
I/15 DC COM1
05-19
05-20
05-21
05-22
05-23
05-24
05-25
05-26
05-27
05-28
05-29
05-30
05-31
05-32
05-33
05-34
05-35
05-36
DC1
06-01
DC2
06-01
6556-MLCBKDC CLUTCH/BRAKE KIT
Rockwell Automation
Information & Automation Systems
KOD
04-05-00
6556MLCBDC
A
05
10


8
7
6
5
D
C
B
A
05-36
DC1
RIGHT RUN
STATION
PBA10300
TBCB
DC1
06-01
06-20
LEFT RUN
STATION
PBB10300
06-02
06-19
PIGHT INCH
PBA10302
06-03
06-22
LEFT INCH
PBB10302
06-04
06-21
USEP DIESET MODE
06-05
USEP PEPMIT PUN (IMMEDIATE STOP)
06-06
USEP PEPMIT STAPT/INCH/RUN
06-07
USER INCH/DOWNSTROKE ENABLE
06-08
06-09
DC1
06-10
06-11
06-12
06-13
06-14
06-15
06-16
06-17
06-18
DC1
06-19
AB
1769-IQ16
CHASSIS A SLOT 3
24VDC 16PT INPUT
CA/S3
AI:03/00
IN 0
AI:03/01
IN 1
AI:03/02
IN 2
AI:03/03
IN 3
AI:03/04
IN 4
AI:03/05
IN 5
AI:03/06
IN 6
AI:03/07
IN 7 DC COM0
AI:03/08
IN 8
AI:03/09
IN 9
AI:03/10
IN 10
AI:03/11
IN 11
AI:03/12
IN 12
AI:03/13
IN 13
AI:03/14
IN 14
AI:03/15
I/15 DC COM1
05-36
DC2
DC2
DC2
06-19
1. ALL WIPES APE #18 AWG BLUE UNLESS OTHEPWISE NOTED.
2. ALL GPOUND WIPES APE #14 AWG GPN UNLESS OTHEPWISE NOTED.
3. — — — — — FIELD WIPING.
4. ———— INTEPNAL WIPING.
CAD PAPT
LAYEPING
SELECT
ECHO


4
3
2
1
D
C
B
A
D6-18
DC1
LEFT RUN
STATION
PBBI0300
TBCB
DC1
06-02
RIGHT RUN
STATION
PBAI0300
06-01
LEFT INCH
PBBI0302
06-04
RIGHT INCH
PBAI0302
06-03
DC1
07-01
USER DIESET MODE
USER PERMIT RUN (IMMEDIATE STOP)
USER PERMIT START/INCH/RUN
USER INCH/DOWNSTROKE ENABLE
06-19
06-20
06-21
06-22
06-23
06-24
06-25
06-26
06-27
06-28
06-29
06-30
06-31
06-32
06-33
06-34
06-35
06-36
AB
1769-IQ16
CHASSIS B SLOT 3
24VDC 16PT INPUT
CB/S3
D6-18
DC2
BI:03/00
BI:03/01
BI:03/02
BI:03/03
BI:03/04
BI:03/05
BI:03/06
BI:03/07
IN 0
IN 1
IN 2
IN 3
IN 4
IN 5
IN 6
IN 7 DC COM0
BI:03/08
IN 8
BI:03/09
IN 9
BI:03/10
IN 10
BI:03/11
IN 11
BI:03/12
IN 12
BI:03/13
IN 13
BI:03/14
IN 14
BI:03/15
I/15 DC COM1
DC2
07-01
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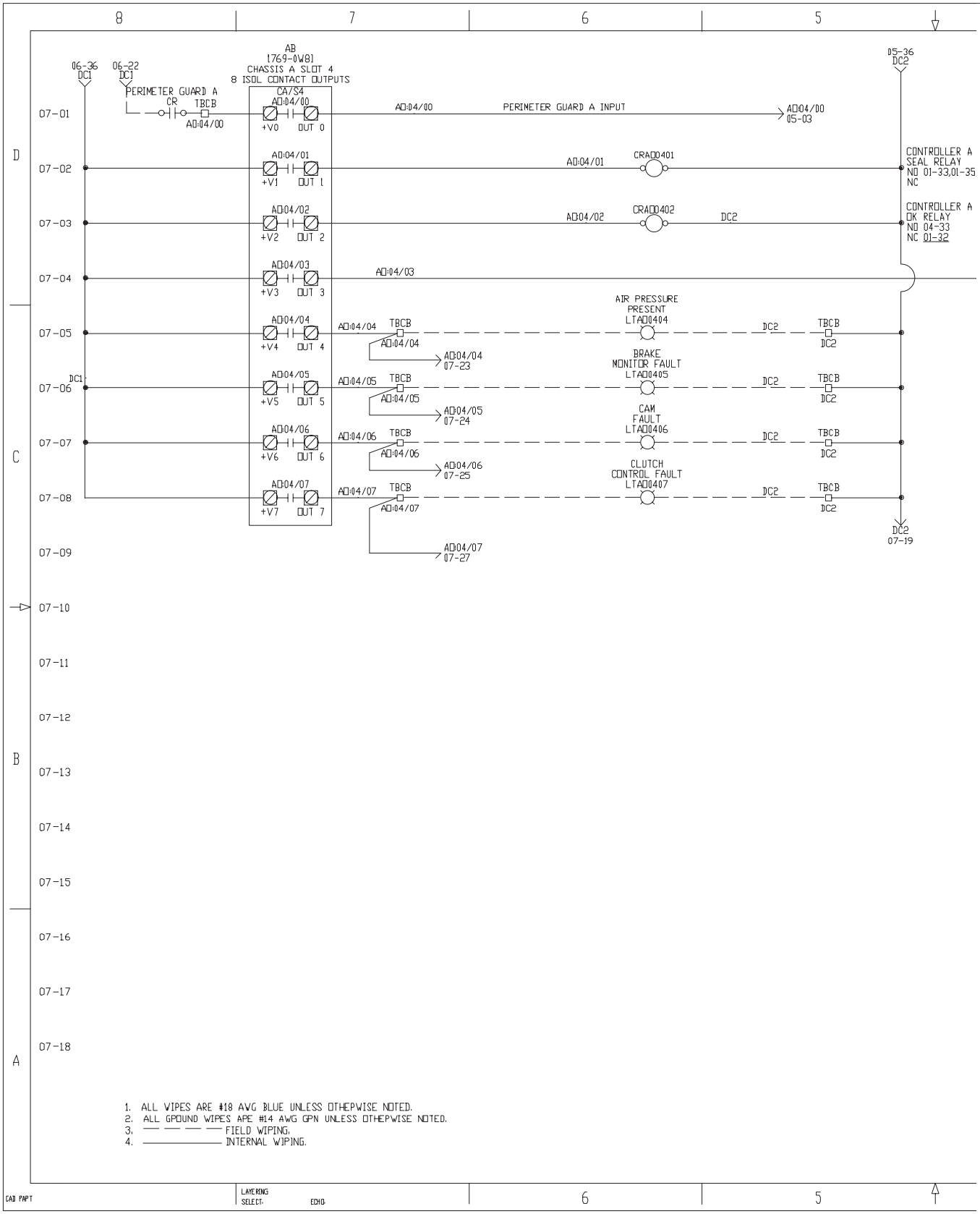
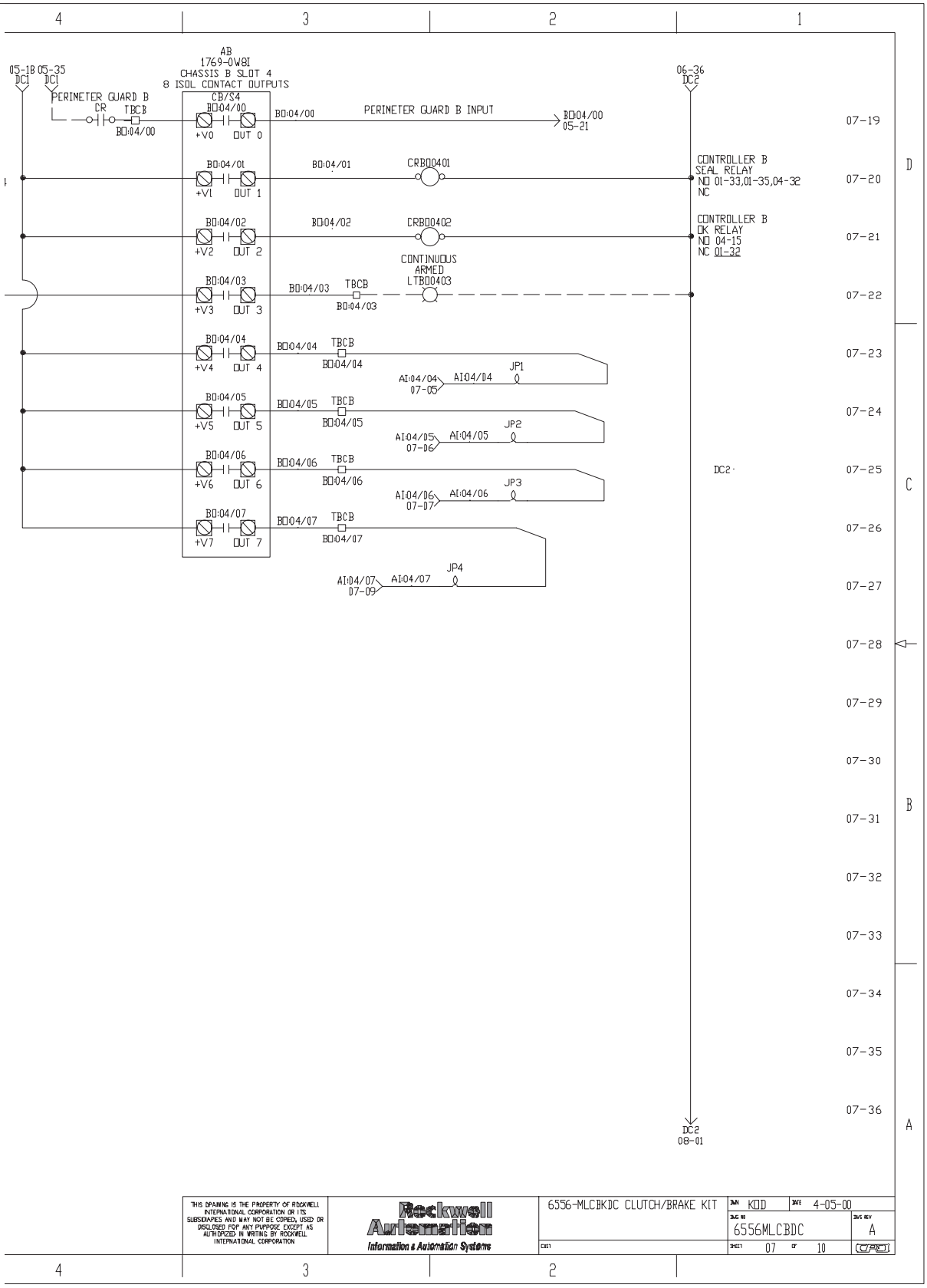
Rockwell Automation
Information & Automation Systems
6556-MLCBKDC CLUTCH/BRAKE KIT
DWN KDD
DATE 04-05-00
DWG NO 6556MLCBDC
REV A
SHEET 06 OF 10


8
7
6
5
AB
1769-OW8I
CHASSIS A SLOT 4
8 ISOL CONTACT OUTPUTS
CA/S4
06-36
DC1
06-22
DC1
PERIMETER GUARD A
CR
TBCB
AO:04/00
AO:04/00
+V0
OUT 0
AO:04/00
PERIMETER GUARD A INPUT
AO:04/00
05-03
05-36
DC2
07-01
D
07-02
AO:04/01
+V1
OUT 1
AO:04/01
CRAO0401
CONTROLLER A
SEAL RELAY
NO 01-33,01-35
NC
07-03
AO:04/02
+V2
OUT 2
AO:04/02
CRAO0402
DC2
CONTROLLER A
OK RELAY
NO 04-33
NC 01-32
07-04
AO:04/03
+V3
OUT 3
AO:04/03
07-05
AO:04/04
+V4
OUT 4
AO:04/04
TBCB
AO:04/04
AO:04/04
07-23
AIR PRESSURE
PRESENT
LTAO0404
DC2
TBCB
DC2
DC1
07-06
AO:04/05
+V5
OUT 5
AO:04/05
TBCB
AO:04/05
AO:04/05
07-24
BRAKE
MONITOR FAULT
LTAO0405
DC2
TBCB
DC2
07-07
C
AO:04/06
+V6
OUT 6
AO:04/06
TBCB
AO:04/06
AO:04/06
07-25
CAM
FAULT
LTAO0406
DC2
TBCB
DC2
07-08
AO:04/07
+V7
OUT 7
AO:04/07
TBCB
AO:04/07
AO:04/07
07-27
CLUTCH
CONTROL FAULT
LTAO0407
DC2
TBCB
DC2
DC2
07-19
07-09
07-10
07-11
07-12
B
07-13
07-14
07-15
07-16
07-17
07-18
A
1. ALL WIRES ARE #18 AWG BLUE UNLESS OTHERWISE NOTED.
2. ALL GROUND WIRES ARE #14 AWG GRN UNLESS OTHERWISE NOTED.
3. — — — — FIELD WIRING.
4. ———— INTERNAL WIRING.
CAD PART
LAYERING
SELECT:
ECHO
6
5


AB
1769-OW8I
CHASSIS B SLOT 4
8 ISOL CONTACT OUTPUTS
CB/S4
05-18 05-35
DC1 DC1
PERIMETER GUARD B
CR TBCB
B□:04/00
B□:04/00
+V0 OUT 0
B□:04/00
PERIMETER GUARD B INPUT
B□:04/00
05-21
06-36
DC2
07-19
B□:04/01
+V1 OUT 1
B□:04/01
CRB□0401
CONTROLLER B
SEAL RELAY
NO 01-33,01-35,04-32
NC
07-20
B□:04/02
+V2 OUT 2
B□:04/02
CRB□0402
CONTROLLER B
OK RELAY
NO 04-15
NC 01-32
07-21
B□:04/03
+V3 OUT 3
B□:04/03
TBCB
B□:04/03
CONTINUOUS
ARMED
LTB□0403
07-22
B□:04/04
+V4 OUT 4
B□:04/04
TBCB
B□:04/04
AI:04/04
07-05
AI:04/04
JP1
07-23
B□:04/05
+V5 OUT 5
B□:04/05
TBCB
B□:04/05
AI:04/05
07-06
AI:04/05
JP2
07-24
B□:04/06
+V6 OUT 6
B□:04/06
TBCB
B□:04/06
AI:04/06
07-07
AI:04/06
JP3
DC2
07-25
B□:04/07
+V7 OUT 7
B□:04/07
TBCB
B□:04/07
AI:04/07
07-09
AI:04/07
JP4
07-26
07-27
07-28
07-29
07-30
07-31
07-32
07-33
07-34
07-35
07-36
DC2
08-01
D
C
B
A
4
3
2
1
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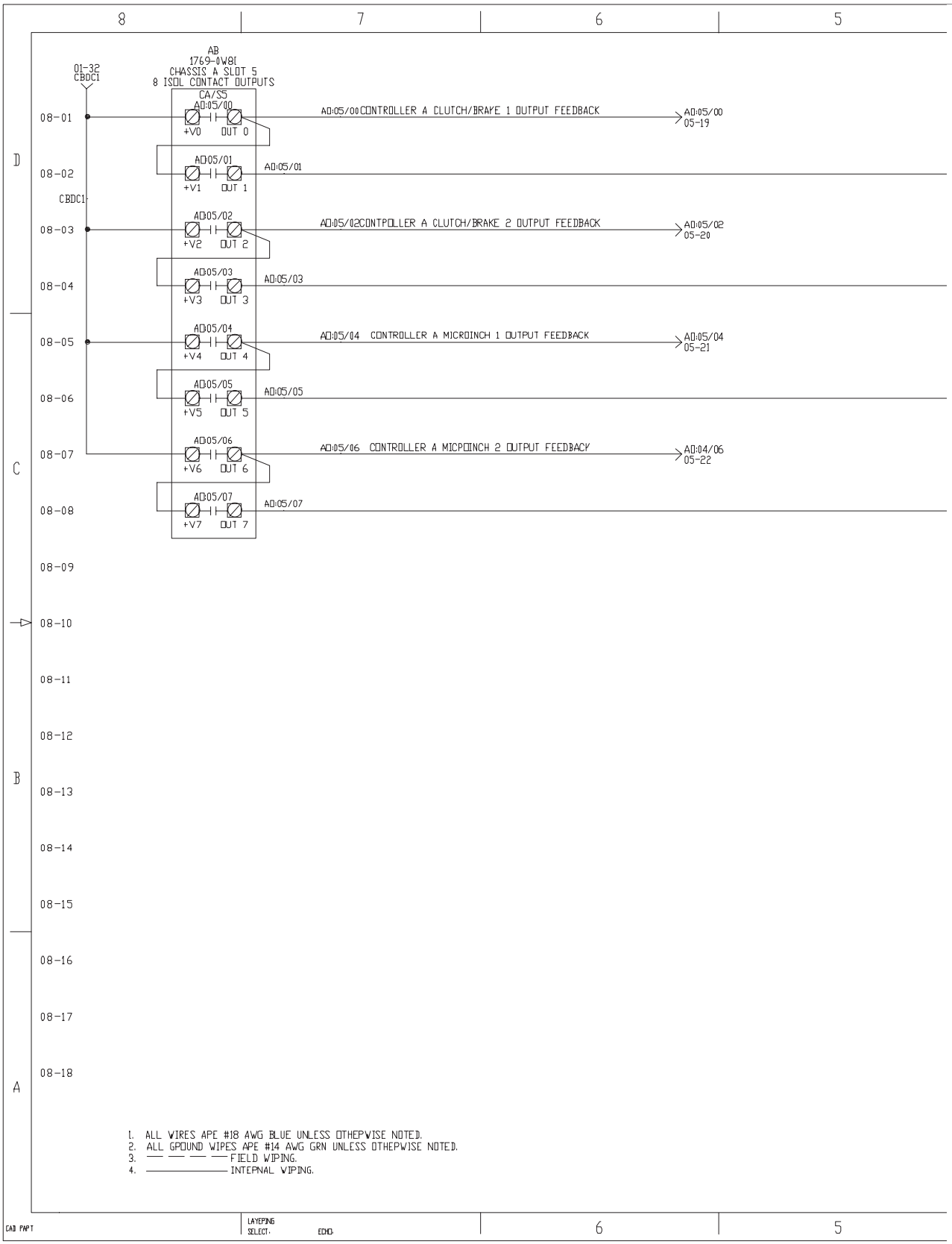
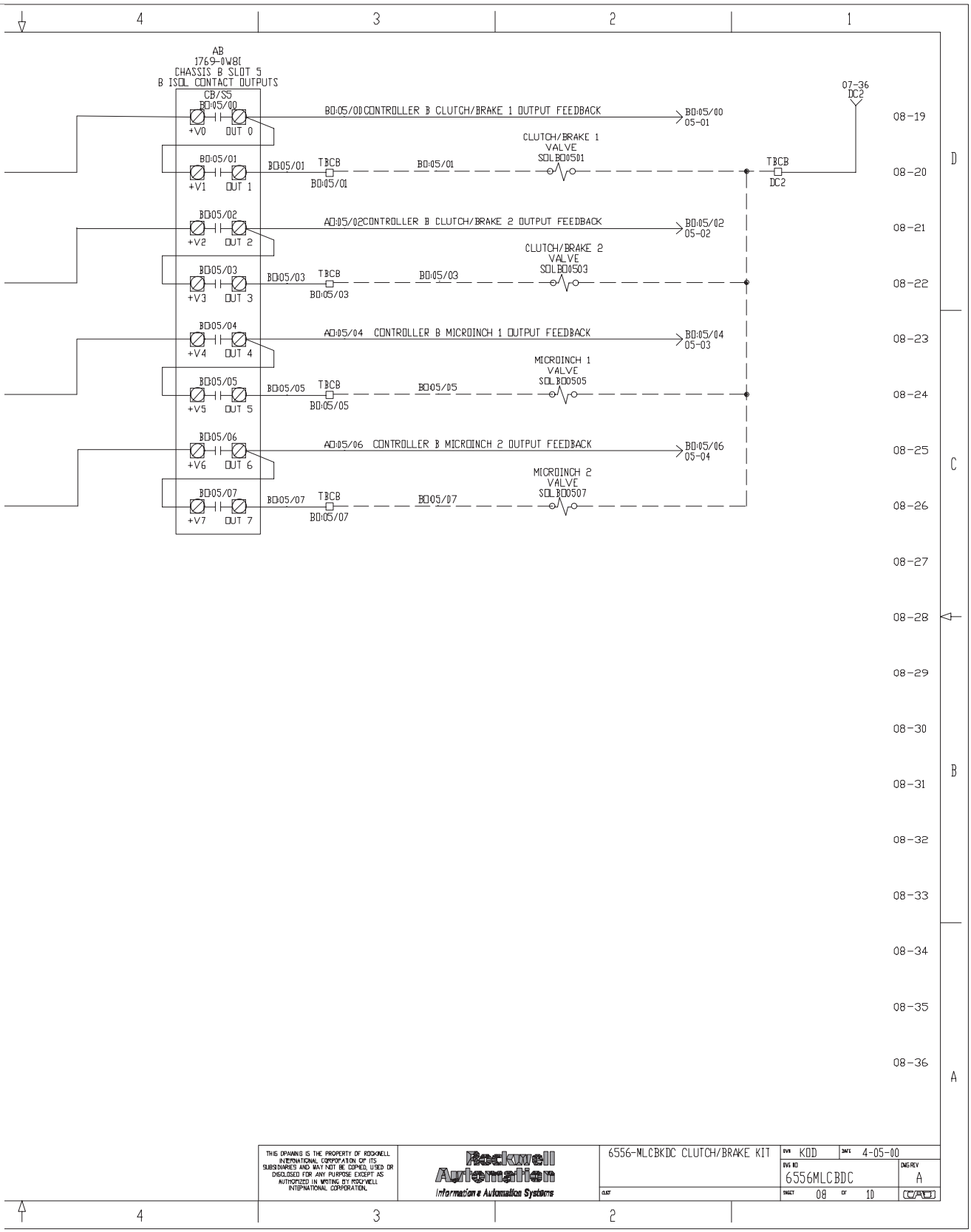
Rockwell Automation
Information & Automation Systems
6556-MLCBKDC CLUTCH/BRAKE KIT
DRAWN KDD
DATE 4-05-00
DWG NO 6556MLCBDC
DWG REV A
SHEET 07 OF 10


8
7
6
5
AB
1769-OW8I
CHASSIS A SLOT 5
8 ISOL CONTACT OUTPUTS
CA/S5
01-32
CBDC1
AO:05/00
AO:05/00 CONTROLLER A CLUTCH/BRAKE 1 OUTPUT FEEDBACK
AO:05/00
05-19
AO:05/01
AO:05/02
AO:05/02 CONTPOLLER A CLUTCH/BRAKE 2 OUTPUT FEEDBACK
AO:05/02
05-20
AO:05/03
AO:05/04
AO:05/04 CONTROLLER A MICROINCH 1 OUTPUT FEEDBACK
AO:05/04
05-21
AO:05/05
AO:05/06
AO:05/06 CONTROLLER A MICPOINCH 2 OUTPUT FEEDBACK
AO:04/06
05-22
AO:05/07
+V0 OUT 0
+V1 OUT 1
+V2 OUT 2
+V3 OUT 3
+V4 OUT 4
+V5 OUT 5
+V6 OUT 6
+V7 OUT 7
08-01
08-02
08-03
08-04
08-05
08-06
08-07
08-08
08-09
08-10
08-11
08-12
08-13
08-14
08-15
08-16
08-17
08-18
D
C
B
A
1. ALL WIRES APE #18 AWG BLUE UNLESS OTHEPWISE NOTED.
2. ALL GPOUND WIPES APE #14 AWG GRN UNLESS OTHEPWISE NOTED.
3. — — — — FIELD WIPING.
4. ———— INTEPNAL WIPING.
CAD PAPT
LAYEPING SELECT.
ECHO.


AB
1769-OW8I
CHASSIS B SLOT 5
B ISOL CONTACT OUTPUTS
CB/S5
B0:05/00
+V0 OUT 0
B0:05/00 CONTROLLER B CLUTCH/BRAKE 1 OUTPUT FEEDBACK
B0:05/00
05-01
07-36
DC2
CLUTCH/BRAKE 1
VALVE
SOLB00501
B0:05/01
+V1 OUT 1
B0:05/01 TBCB
B0:05/01
B0:05/01
TBCB
DC2
B0:05/02
+V2 OUT 2
A0:05/02 CONTROLLER B CLUTCH/BRAKE 2 OUTPUT FEEDBACK
B0:05/02
05-02
CLUTCH/BRAKE 2
VALVE
SOLB00503
B0:05/03
+V3 OUT 3
B0:05/03 TBCB
B0:05/03
B0:05/03
B0:05/04
+V4 OUT 4
A0:05/04 CONTROLLER B MICROINCH 1 OUTPUT FEEDBACK
B0:05/04
05-03
MICROINCH 1
VALVE
SOLB00505
B0:05/05
+V5 OUT 5
B0:05/05 TBCB
B0:05/05
B0:05/05
B0:05/06
+V6 OUT 6
A0:05/06 CONTROLLER B MICROINCH 2 OUTPUT FEEDBACK
B0:05/06
05-04
MICROINCH 2
VALVE
SOLB00507
B0:05/07
+V7 OUT 7
B0:05/07 TBCB
B0:05/07
B0:05/07
08-19
08-20
08-21
08-22
08-23
08-24
08-25
08-26
08-27
08-28
08-29
08-30
08-31
08-32
08-33
08-34
08-35
08-36
D
C
B
A
4
3
2
1
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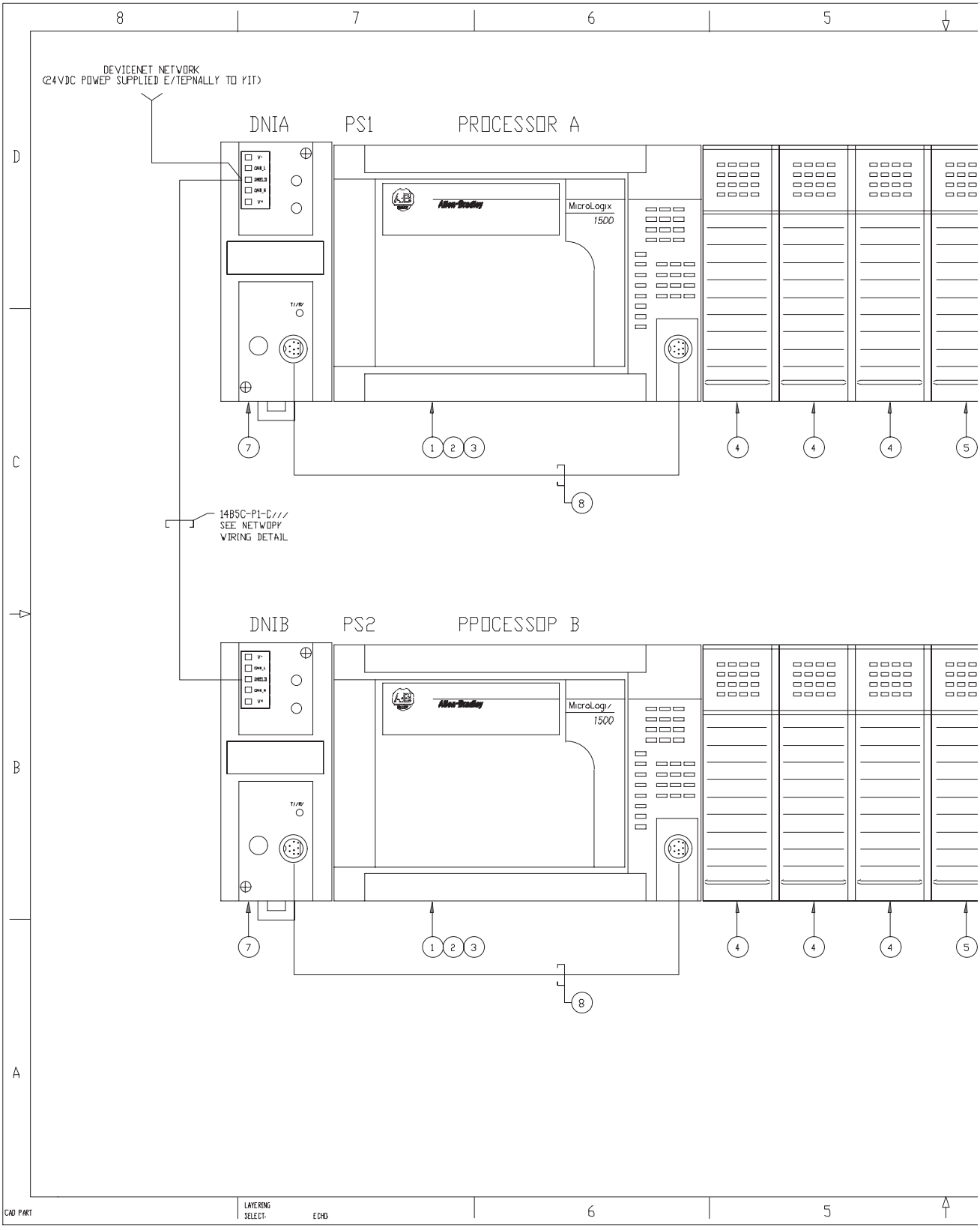
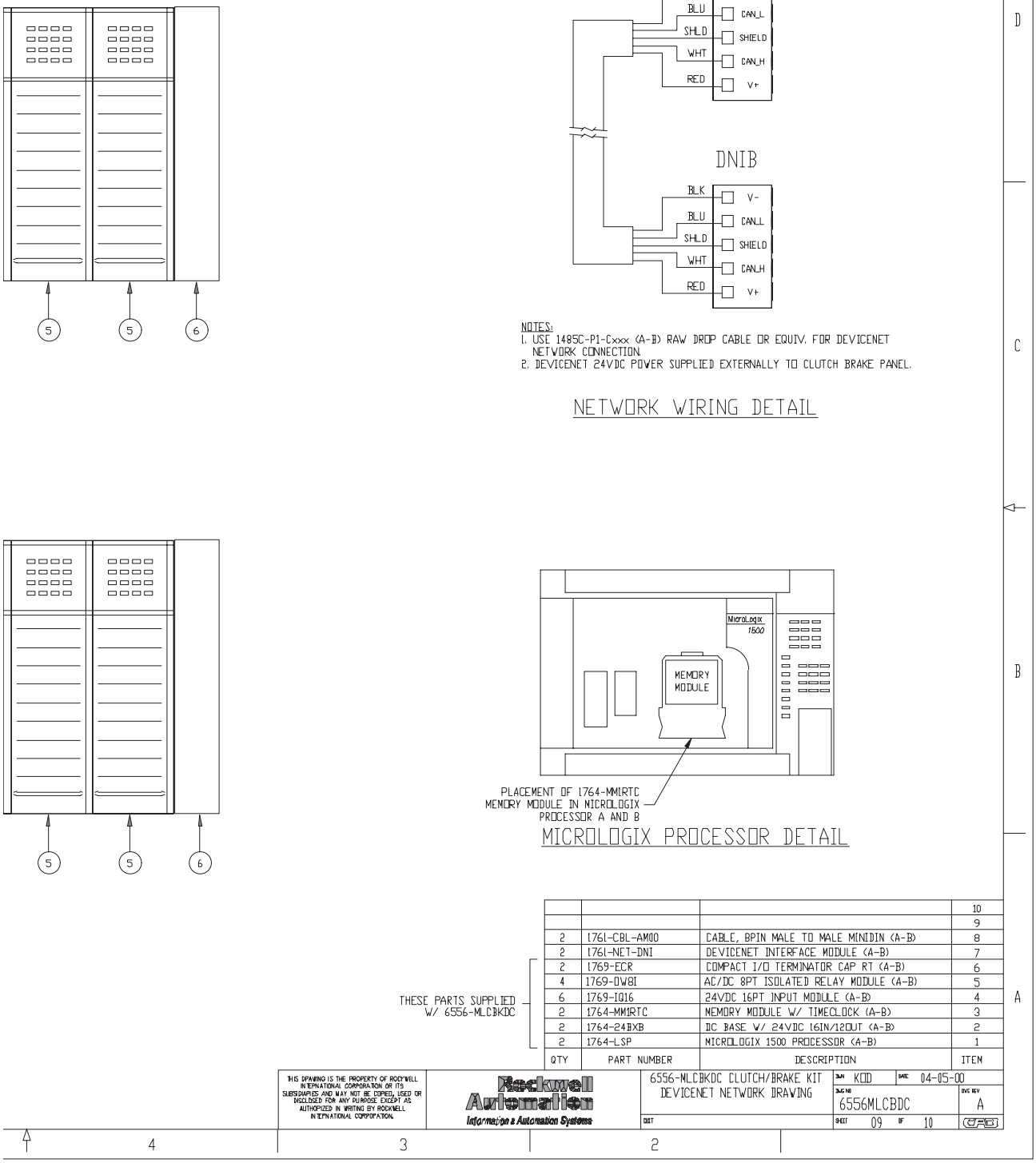
Rockwell Automation
Information & Automation Systems
6556-MLCBKDC CLUTCH/BRAKE KIT
DWN KOD
DATE 4-05-00
DWG NO 6556MLCBDC
DWG REV A
SHEET 08 OF 10


8
7
6
5
D
C
B
A
DEVICENET NETWORK
(24VDC POWER SUPPLIED EXTERNALLY TO KIT)
DNIA PS1 PROCESSOR A
MicroLogix 1500
7
1 2 3
4
4
4
5
8
14B5C-P1-C///
SEE NETWORK
WIRING DETAIL
DNIB PS2 PROCESSOR B
MicroLogix 1500
7
1 2 3
4
4
4
5
8
CAD PART
LAYERING SELECT.
ECHO
6
5


4
3
2
1
D
C
B
A
DNIA
BLK
BLU
SHLD
WHT
RED
V-
CAN_L
SHIELD
CAN_H
V+
DNIB
BLK
BLU
SHLD
WHT
RED
V-
CAN_L
SHIELD
CAN_H
V+
5
5
6
NOTES:
1. USE 1485C-P1-Cxxx (A-B) RAW DROP CABLE OR EQUIV. FOR DEVICENET NETWORK CONNECTION.
2. DEVICENET 24VDC POWER SUPPLIED EXTERNALLY TO CLUTCH BRAKE PANEL.
NETWORK WIRING DETAIL
MicroLogix 1500
MEMORY MODULE
PLACEMENT OF 1764-MM1RTC MEMORY MODULE IN MICROLOGIX PROCESSOR A AND B
MICROLOGIX PROCESSOR DETAIL
THESE PARTS SUPPLIED W/ 6556-MLCBKDC
10
9
2 1761-CBL-AM00 CABLE, 8PIN MALE TO MALE MINIDIN (A-B) 8
2 1761-NET-DNI DEVICENET INTERFACE MODULE (A-B) 7
2 1769-ECR COMPACT I/O TERMINATOR CAP RT (A-B) 6
4 1769-OW8I AC/DC 8PT ISOLATED RELAY MODULE (A-B) 5
6 1769-IQ16 24VDC 16PT INPUT MODULE (A-B) 4
2 1764-MM1RTC MEMORY MODULE W/ TIMECLOCK (A-B) 3
2 1764-24BXB DC BASE W/ 24VDC 16IN/12OUT (A-B) 2
2 1764-LSP MICROLOGIX 1500 PROCESSOR (A-B) 1
QTY PART NUMBER DESCRIPTION ITEM
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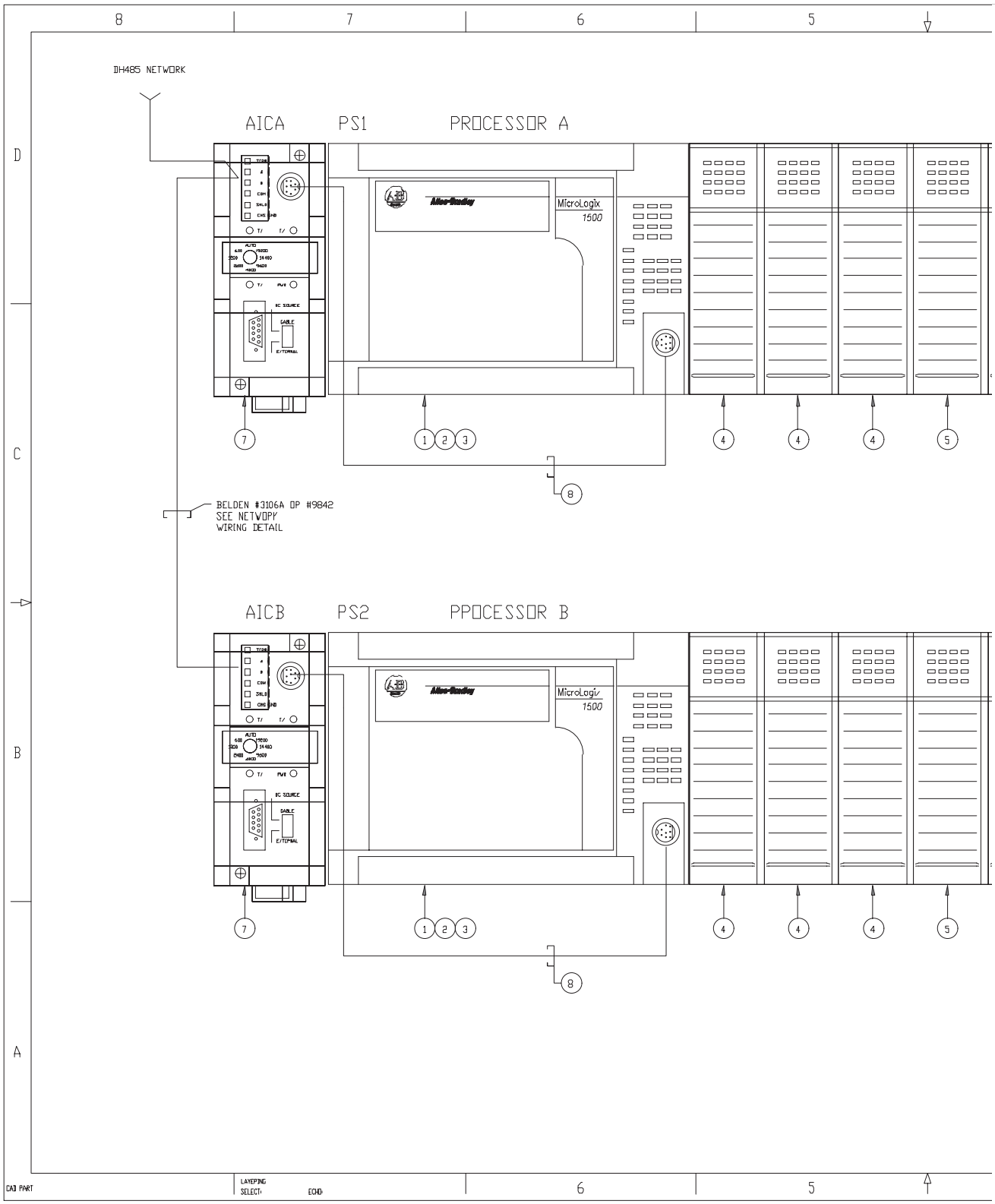
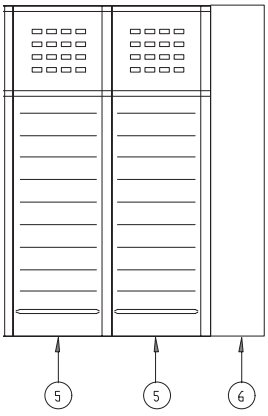
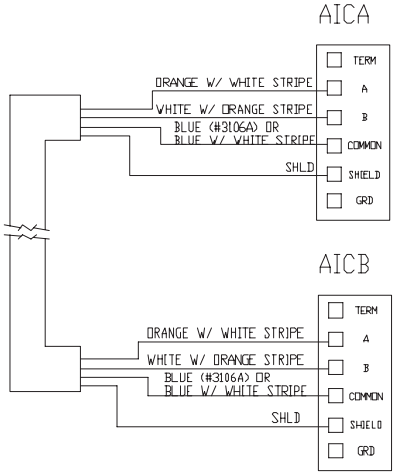
Rockwell Automation
Information & Automation Systems
6556-MLCBKDC CLUTCH/BRAKE KIT DEVICENET NETWORK DRAWING
DRAWN KOD DATE 04-05-00
DWG NO 6556MLCBDC
DWG REV A
SHEET 09 OF 10
DIST

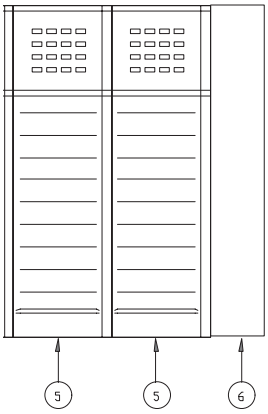

8
7
6
5
D
C
B
A
DH485 NETWORK
AICA PS1 PROCESSOR A
MicroLogix
1500
BELDEN #3106A OR #9842
SEE NETWORK
WIRING DETAIL
AICB PS2 PROCESSOR B
MicroLogix
1500
CAD PART
LAYERING
SELECT:
ECAD
6
5

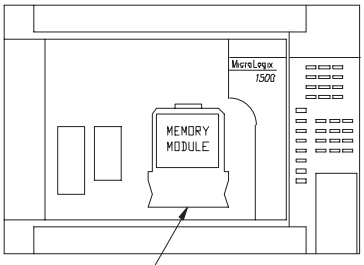



NOTES:
1. USE BELDEN #3106A OR #9842 CABLE OR EQUIV. FOR DH-485 NETWORK CONNECTION.

## NETWORK WIRING DETAIL




PLACEMENT OF 1764-MM1RTC MEMORY MODULE IN MICROLOGIX PROCESSOR A AND B

## MICROLOGIX PROCESSOR DETAIL

| | | | ITEM |
|---|---|---|---|
| | | | 10 |
| | | | 9 |
| 2 | 1761-CBL-AM00 | CABLE, 8PIN MALE TO MALE MINIDIN (A-B) | 8 |
| 2 | 1761-NET-AIC | ADVANCED INTERFACE CONVERTER MODULE (A-B) | 7 |
| 2 | 1769-ECR | COMPACT I/O TERMINATOR CAP RT (A-B) | 6 |
| 4 | 1769-OW8I | AC/DC 8PT ISOLATED RELAY MODULE (A-B) | 5 |
| 6 | 1769-IQ16 | 24VDC 16PT INPUT MODULE (A-B) | 4 |
| 2 | 1764-MM1RTC | MEMORY MODULE W/ TIMECLOCK (A-B) | 3 |
| 2 | 1764-2BBXB | DC BASE W/ 24VDC 16IN/12OUT (A-B) | 2 |
| 2 | 1764-LSP | MICROLOGIX 1500 PROCESSOR (A-B) | 1 |
| QTY | PART NUMBER | DESCRIPTION | ITEM |

THESE PARTS SUPPLIED W/ 6556-MLCBKDC

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Rockwell Automation
Information & Automation Systems

6556-MLCBKDC CLUTCH/BRAKE KIT
DH485 NETWORK DRAWING

DWN KDD DATE 04-05-00
DWG NO 6556MLCBDC
DWG REV A
SHEET 10 OF 10

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